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Studies in Epistemology, Logic, Methodology, and Philosophy of Science

Richard Routley *Author*
Maureen Eckert *Editor*

Exploring Meinong's Jungle and Beyond

The Sylvan Jungle — Volume 1

Springer

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The Sylvan Jungle

This book is part of a collection of four books that present the work of the iconic and iconoclastic Australian philosopher Richard Routley (né Sylvan).

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- Exploring Meinong's Jungle and Beyond
- Noneist Explorations I
- Noneist Explorations II
- Ultralogic as Universal?

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Exploring Meinong's Jungle and Beyond

The Sylvan Jungle — Volume 1

with Supplementary Essays

Springer

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Editors' Preface

In 1980 Richard Sylvan (then named 'Richard Routley') published *Exploring Meinong's Jungle and Beyond: An investigation of noneism and the theory of items*. Even though this book has generated considerable debate and has contributed to the development of neo-Meinongianism, published through the Australian National University, it is now out of print and the few available second-hand copies are expensive. This, coupled with developments in the area since the book's original publication, have led us to think that there are benefits in reprinting this extensive work along with commentaries that situate and discuss the rich philosophical material contained in the work.

To this end, and with the support of Springer, we reprint the work here in four volumes. Volume One centres on the lengthy first chapter of the original work that describes noneism – Sylvan's neo-Meinongian position – and the theory of items. In addition to the commentary essays, the Volume also includes a later paper of Sylvan's revisiting and revising his item-theory. Volumes Two and Three include the remaining chapters from the original work (i.e. chapters 2 to 12 of the original) and further commentary essays including one by J.J.C. Smart, Sylvan's colleague at the ANU for many years. And the final volume, Volume Four, centres on Sylvan's Appendix, 'Ultralogic as universal?', with further commentary essays.

Some of the work reprinted in Volumes Two and Three contains material that formed part of a broad, ongoing research project that Sylvan pursued with Val Plumwood (formerly Val Routley). We have indicated where reprinted work is jointly authored.

We have sought to correct obvious errors, and have updated some references. While attempts were made to locate and reproduce the photographs that Sylvan included in the original publication (see the introductory essay by Hyde), the passage of time has erased their tracks and they too, like Sylvan, are sadly non-existent. We have, however, been able to find further photographs of the same area as that pictured in the original monograph

by one of the original photographers, Henry Gold, and with his kind permission reproduce his *Creek lilies, antarctic beech and epiphytes* in this volume.

For help in the production of this first volume, thanks go to: Louise Sylvan for her permission to reprint Richard's original material; *Grazer Philosophische Studien* for permission to reproduce 'Re-exploring item-theory'; the ever-helpful archivists at the University of Queensland Fryer Library (where Sylvan's extensive archive is housed); Michael Kebrt and the Word-to-LaTeX crew; and funding from the University of Queensland.

* * * * *

A note on cross-referencing within and across volumes: when typesetting this volume, pagination was not available for subsequent volumes of this reprint of *Exploring Meinong's Jungle and Beyond*. With the four-volume reprint cited as "$EMJB_2$", page references are therefore only available for $EMJB_2$ Vol. 1. Other page references are to the first edition, cited as "$EMJB_1$" (available at http://hdl.handle.net/11375/14805). *Section* references are then also given for the later volumes of the reprint, to facilitate locating them in $EMJB_2$.

Maureen Eckert
Ross Brady
Filippo Casati
Nicholas Griffin
Dominic Hyde
Chris Mortensen
Graham Priest
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Introduction: The Jungle Book in context

Dominic Hyde

The first thing one notices about the book that has become known as "the Jungle Book" – *Exploring Meinong's Jungle and Beyond. An Investigation of Noneism and the Theory of Items* – is its size. The original, single-volume monograph was more than one thousand pages in length; 1035 pages, to be exact. Its author was not unaware of its consequent alternate use as an "excellent and cheap doorstop".[1]

The second thing one notices, on turning to its Contents, is the associated scope of the work. Given Sylvan's[2] persistent, general view that "a coherent philosophy selects and develops its resolutions uniformly, with connected solutions for related problems"[3], and his particular concern in the Jungle Book that a "fundamental philosophical error" unites many existing approaches to a broad sweep of philosophical problems, one would expect that a uniform solution to these problems is called for. And that expectation is precisely what Sylvan attempts to meet in this ambitious work, developing a metaphysical view that makes room for non-existent objects, along with the necessary logical innovations involving intensional logics, paraconsistent and paracomplete logics, and relevant logics; and therewith showing how to go beyond perennial philosophical "problems" engendered by "the main philosophical positions of our times" – empiricism, idealism and materialism.

Thus Sylvan argues that his neo-Meinongian, so-called "noneist" (pronounced *none-ist*), theory at the heart of the Jungle Book casts new light on supposed long-standing problems like the problem of universals, perception, intentionality, substance, self, and values. Chapters are devoted to metaphysical and associated epistemological problems

[1] Sylvan 1995, Prologue.
[2] Richard Sylvan was known as Richard Routley until he changed his name in 1984.
[3] Sylvan and Hyde 1993, p. 1.

that emerge in the philosophy of mathematics and philosophy of science, to developing a satisfactory epistemology more generally, to providing an adequate semantic account of fictional discourse, to an analysis and rejection of Russell's theory of descriptions and of Quine's objections to broadly-Meinongian approaches, and so on. The book's size matches its ambitions. And the book's author was a man of considerable intellectual ambition.

Published in 1980, it was available for $10 from the department in which Sylvan worked, and from which he published this and many other philosophical works. Though he published nearly two hundred articles and book chapters in the conventional manner, and six books with industry publishers, he was wary of the profit-motives of publishers, their gate-keeper role in deciding what was and what was not worthy of publication, and the form and length the work should take. Rarely accused of excessive brevity, he frequently chose to publish long essays, booklets and books in-house through the Australian National University presses. The Jungle Book was the lengthiest of these.

His tendency to write freely, and with considerable skill, was already evident in his earliest work. Writing his MA thesis at Victoria University, New Zealand – typically an 80 page piece of research – he produced a 385 page work, *Moral Scepticism*. Not only was it incredibly long, it was incredibly good according to its marker, Arthur Prior. Prior wrote some six years later in a reference for Sylvan that "he'd given it a mark of 95%, but this was not so much a mark as an exclamation mark".[1] Blackwells agreed to publish a condensed version of it but the necessary revisions were never carried out. So already as a young student he showed his capacity to write expansively, with great skill, with early signs of an aversion to the editorial work required by the establishment academy presses. And a couple of years later, while a graduate student at Princeton, he received the Tomb Essay Prize for an essay on time travel – at 100 pages its length obviously did not count too heavily against it. The Jungle Book, too, is big but Sylvan thought there was a lot to say and he was not shy in saying it *all*.

The book's size combined with the fact that it was published in-house is, in an important respect, regrettable. It has had the consequence that it has remained relatively inaccessible. In the Preface to the Jungle Book he had expressed doubts about the view that "truth and reason will out", and these doubts in relation to the views defended in the

[1] Goddard, to whom the reference was sent in 1963, in a speech to the Memorial Gathering for Sylvan upon his death, ANU June 24 1996.

Jungle Book are only exacerbated by the lack of serious consideration given to them by philosophers due to the work's relative inaccessibility. As with his early work on moral scepticism, Sylvan did have opportunities to air his ideas and arguments in more succinct form through well-recognised industry channels. Early versions of what eventually were expanded to become chapters 1 and 2 of the Jungle Book – Routley 1967 and Routley 1968 respectively – were accepted for publication in the late 1960s in the *Australasian Journal of Philosophy* and the *Notre Dame Journal of Formal Logic* but, partly due to dissatisfaction with their current forms at the time, he never followed through with their publication.

His general tendency to work outside and against the mainstream resulted in truly unorthodox and innovative philosophical work but also had the general effect of leaving the dissemination of this work to unorthodox channels of communication. As a consequence, I think it is fair to say that the Jungle Book has never received the broader consideration and discussion it deserves within the philosophical community. The reprinting of it in this four-volume set is an attempt to help rectify this regrettable history. Whether right or wrong, there is much to think about in the pages that follow, and many arguments that, as Sylvan said, cast new light on old problems. Only the most dogmatic will fail to be challenged in ways that help advance philosophical thinking – and dogmatism is the enemy of good philosophy.

Background

As with much of Sylvan's work, this monumental book includes ideas dating back a long way – back to at least 1964, but arguably right back to his graduate days at Princeton. He had gone there in 1959 to pursue a PhD at the urging of Jack Smart, rather than tread the more usual path to a British university, and commenced study under Alonzo Church.

> As a brash young man I set out from New Zealand for Princeton University with a project of trying to repair and renovate a derelict philosophy of science, resolving many of its evident problems, through an improved logical basis and corresponding theoretical set-

> ting. This project was hardly enthusiastically welcomed at Princeton, and I made comparatively little progress on it there ...[1]

He left after just two and a half years, having received his MA in 1961, and took up a lectureship at the University of Sydney in 1962. (The Jungle Book was later submitted to Princeton for examination for his PhD, and while they declined to examine it all, he received his doctorate for chapter 1 – reprinted in this volume.)

At Sydney he met student Val Macrae (later Val Routley and then Val Plumwood) and together they soon moved on to the University of New England. It was here, while Sylvan worked with Len Goddard on topics in non-classical logic and paradox, that he first published papers on problems of existence and associated logical issues, and in discussion with Plumwood first identified what they came to see as "the fundamental philosophical error" – the Reference Theory.

This error, levelled across the board at empiricists, idealists and materialists alike, was the acceptance of the "naive and mistaken" view that "all proper use of subject expressions in true or false statements is referential use, use to refer [to some existing item in the actual world], and thus according to which truth and falsity can be entirely accounted for, semantically, in terms of reference to entities in the actual world. That is, the only factor that determines truth is reference [to actual existing items]." Granting the assumption that meaning is a function of truth, the theory is sometimes expressed as a theory of meaning according to which "the meaning of a subject expression is given by, or is a function of, its reference [to actual existents]".[2]

Thus a perceived characteristic of the fallacious Reference Theory was "the rejection of all discourse whose truth-value cannot be determined simply in terms of the reference of its (proper) subject-terms [to actual existents], particularly intensional discourse".[3] And an obvious corollary, then, of the fallacious Reference Theory was what Sylvan termed "the Ontological Assumption", the view that one cannot make true statements about what does not exist and that, consequently, "nonentities are featureless, only what exists can truly have properties".[4]

---

[1] Sylvan 2000, p. 7.

[2] Routley and Routley 1973a, pp. 234–5, where the Reference Theory is first named, in work which was first submitted for publication in 1965.

[3] *Ibid.*, p. 235.

[4] $EMJB_2$ this volume, p. 29.

His arguments for the falsity of this theory then led, most notably, to his advocacy of noneism – a theory of objects which aims at

> a very general theory of all items whatsoever, of those that are intensional and those that are not, of those that exist and those that do not, of those that are possible and those that are not, of those that are paradoxical or defective and those that are not, of those that are significant or absurd and those that are not; it is a theory of the logic and properties and kinds of properties of all these items.[1]

It was this theory that he identified as being at the heart of the neo-Meinongian project that the Jungle Book went on to lay out – following "a great, largely subterranean, philosophical tradition ... stretching from the Epicureans to modern times".[2]

Initially though, developing on his intended doctoral project at Princeton, one key area where problems generated by ontological assumptions emerged was precisely in the philosophy of science where mathematical and theoretical language could not be adequately analysed, Sylvan argued, without a recognition of the standing of non-existent items. One of his earliest papers, "What numbers are" (1965), argued that they were to be analysed in intensional terms; numbers are properties, with the analysis using a noneist variant of the standard logicist analysis. And in the following year he published "Some things do not exist", which took as a key example quantification over ideal (non-existent) items for the formulation of scientific laws (cf. Routley 1966, p. 259). The development of a logic and metaphysics capable of adequately accounting for non-existent items, nonentities, was already a central goal of this early work.

This concern for an adequate ontology for mathematics and the theoretical sciences and concern, more generally, to argue for a viable alternative to the perceived detrimental effects of an empiricist philosophy of science – one of Sylvan's *bêtes noires* given its dominance in the philosophical landscape – is an important theme in the Jungle Book, with two chapters devoted to it (chapters 10 and 11; reprinted here in Volume 3).

> The more comprehensive case for the importance of nonentities includes, as especially significant, their role in mathematics and their roles in theoretical explanations of science – the whole business, that

[1] $EMJB_2$ this volume, p. 7.
[2] Routley 1976, p. 191.

> is, of appealing to ideal simplified objects, which suitably approximate real objects, in problem solving and theoretical explanation. More generally, the theoretical sciences are seriously non referential, both in having as their primary subject matter nonentities, and in being ineradicably intensional. This thesis runs entirely counter to empiricist philosophies of science, which have long dominated the subject (to its detriment), according to which the language of science is, or ought to be, referential.[1]

And already in these very early papers, too, Sylvan saw a need to make room in the domain of the logic being developed for "impossible items" – though he hesitated, at this early point, before giving them full logical standing – and for empty domains. It was here, too, at this early stage that Meinongianism emerged as a source for an adequate theory that rejected classical ontological assumptions and all that went with it. In 1967 Sylvan drafted a lengthy (125 page) essay "Exploring Meinong's jungle" (subsequently circumscribed as "Exploring Meinong's jungle I").

The essay again addressed the themes of mathematical and theoretical entities, but also extended into new areas and saw the discussion as "closely related to Meinong's discussion of objects".[2]

> Why try to further Meinong's theory of objects? ... First, a theory of items provides a way of avoiding Platonism without abandoning talk of abstract items such as numbers and abstract classes. ... Secondly, various problems in the philosophy of mathematics can be given attractive solutions ... How mathematical theories can treat of seventeen dimensional spaces, of ideal points and masses, and of transfinite cardinals is easily explained: these theories treat of *non*-entities. ... Thirdly the theory of items provides a basis on which quantified intensional logics can be erected; for the theory provides a partial solution to the problem of quantifying into intensional sentence contexts. ... Fourthly, the philosophical difficulties over the interpretation of quantifiers in chronological logics can be resolved[3]

[1] $EMJB_1$, p. 769; i.e. $EMJB_2$ Vol. 3, chapter 10, opening passage.
[2] Routley 1967, p. 1.
[3] A "resolution" was laid out in considerable technical detail in Routley 1968 – i.e. "Exploring Meinong's jungle II" – a paper already in draft form.

> ... Lastly, a theory of items has its advantages as a basis for recent revolutionary, but atheist-like and bizarre, religious positions which consider God as a non-entity ... Seriously, however, an ontologically neutral logic, unlike classical logics, provides a basis on which various religious positions can be reformulated and formally assessed by an atheist.[1]

There was ample reason to "further" Meinong's theory. Meinong was clearly now "in the frame".

An important requirement for a decent theory of items through a proper reworking of Meinongianism, identified by Sylvan right from the beginning of these enquiries, was the need to abandon classical logic. Meinong's theory had suffered, he thought, from a lack of the necessary logical innovation required to model the behaviour of the objects to be countenanced in the new theory. In fact, "Meinong scarcely develops the logic of his theory of objects" at all but there was clearly a "need for revision of classical logic".[2]

Already in "Some things do not exist" Sylvan had moved beyond classical logic, using (non-existentially-loaded) neutral quantifiers, for example. And by 1967 he was considering failures of both the Law of Non-Contradiction and the Law of Excluded Middle in the face of impossibilia and incomplete items.[3] (By the time this material appeared in print in chapter 1 of the Jungle Book, these apparent failures were somewhat qualified – cf. $EMJB_2$ this volume, p. 114. For further discussion of the absence of a more radical non-classical approach see the Griffin essay, this volume.) With the Reference Theory subsequently identified as the fundamental error, and given that "the Reference Theory yields classical logic, and directly only classical logic", classical logic was marked out as "the logic of the Reference Theory" and all the worse for that. He called for "a logical revolution" going beyond consistency and completeness assumptions, in addition to neutral quantification theory, to accommodate the non-classical behaviour of the many items whose standing he now sought to recognise. And he saw the subsequent work of the Canberra Logic Group, focused on developing satisfactory non-classical relevant logics, as a central component of his broad and systematic reworking of the philosophical landscape, alongside work on paraconsistency with Graham Priest (a regular member

[1] Routley 1967, pp. 2–6.
[2] Routley 1967, pp. 1 and 22 respectively.
[3] See Routley 1967, pp. 24 ff .

of the Group). *Relevant Logics and Their Rivals I*, summarising nearly a decade of the Group's progress in the field and appearing two years after the Jungle Book in 1982, was described as "a companion volume" to the already-lengthy treatment of the broad range of philosophical problems tackled in the Jungle Book. And though it would not appear with an "industry press" until 1989, Priest and Sylvan were well-advanced on their edited collection *Paraconsistent Logic. Essays on the Inconsistent* – a further elaboration of the necessary "logical revolution" and applications.[1]

This revolution went hand-in-hand with the idea that "all logical phenomena are admitted and studied for what they are and as far as can be without distortion or subjection to preassigned and quite possibly defective moulds, positions and logical structures".[2] Sylvan sought to account for language as it appears, as much as possible.

> Just as logic functions, on the noneist picture, not as a superior replacement for actual language, but as an addition to it, as extension of it, so linguistic analysis becomes a superstructure built on natural language which does not require reduction to a "deeper" canonical form. The fact that a canonical form cannot cater for surface structure commonly shows, not the unsatisfactoriness of the surface form, but the inadequacy of the canonical forms.[3]

The canonical forms as dictated by classical logic were clearly inadequate, so he argued at length.

As with comments made elsewhere, for example in applied ethics[4], Sylvan thought that the entrenchment of objectionable theory was driving a plethora of objectionable and unnecessary philosophical theses. "The contemporary state of complacency with respect to the manifold deficiencies of classical logic and classical theories reflects ... the usual (if deplorable) scientific process of entrenchment whereby once revolutionary young theories become, as they age, conservative members of the establishment".[5] Where his opponents

[1] Sylvan continued with this rich vein of research right up until his death. Posthumous publications in the area include his 2000 *Sociative Logics and Their Applications* and the long-awaited *Relevant Logics and Their Rivals II*, completed by Ross Brady in 2003. For a nice overview of some of the innovative Australian work in non-classical logic which Sylvan was helping develop and which he was drawing on, see Martin 1992.

[2] $EMJB_2$ this volume, p. 358.

[3] $EMJB_2$ this volume, p. 359.

[4] Cf. Sylvan 1993.

[5] Routley, Meyer, Plumwood and Brady 1982, p. xi.

entrenched classical theory and committed to the consequences, however problematic, he took the problems to be symptomatic of bad underlying theory. As they say, one person's *modus ponens* is another's *modus tollens* and what Sylvan saw as the primacy of the non-distorted data led him to apply *modus tollens* more frequently than almost any other philosopher.

Also central to the noneist program was, of course, the topic of reference and associated issues to do with significance, what can meaningfully be spoken about, and a theory of aboutness more generally. For example, classical theory took the aboutness relation to be a "reference" relation – a relation to something existent – but Sylvan took the non-distorted data to show that 'a' may be about, signify, or designate something that need not exist. A more general theory of aboutness was needed than one which simply equated it with "reference" – a fallacious equation which he took to be "a source of the R[eference] T[heory]".[1] This and the topic of significance, more generally, were the focus of the other "companion volume" to the Jungle Book, Sylvan's 1973 treatise with Goddard, *The Logic of Significance and Context*.[2]

A grand ambition underlying all this work was a universal semantics and universal logic in a noneist fashion – "the interwoven (large, ambitious, and rather exhausting) project of furnishing a logico-semantical theory for natural languages, and a semantics for English in particular".[3] A universal logic

> is one which is applicable in every situation whether realised or not, possible or not. Thus a universal logic is like a universal key, which opens, if rightly operated, all locks. It provides a canon for reasoning in every situation, including illogical, inconsistent, and paradoxical ones. Few prevailing logics stand up to such a test.[4]

Certainly classical logic, and its main alternatives, fail to stand up. In the Appendix to the Jungle Book, "Ultralogic as universal?" (reprinted here in Volume 4), Sylvan contends that a relevant logic ought provide a suitable foundation. What is sought is an "ultramodal" intensional logic – one that goes beyond the usual modal logics that admit

[1] $EMJB_2$ this volume, p. 74.
[2] It was listed as "Volume I", with a second volume intended. But with the deaths of both Sylvan and Goddard, this second volume will remain nonexistent.
[3] $EMJB_2$ this volume, p. 456.
[4] $EMJB_1$, Appendix, p. 893; i.e. $EMJB_2$ Vol. 4, "Ultralogic as universal?", opening paragraph.

of substitution *salva veritate* of strict equivalents; a hyperintensional logic as a key to the logical universe.

With work already published on a universal semantics (cf. Routley 1975), a beginning on a universal logic is described in the Jungle Book.

> Here a logico-semantical framework has been presented, but few are the details so far given as to *how it is to be applied*, how the impressive variety of English parts of speech are to be semantically encompassed within the framework. ... the framework gives little guidance as to how such nondeclarative sentences as imperatives and questions are to be encompassed, rather it leaves a range of options open.[1]

As with much of Sylvan's work, he saw himself as making a beginning, a start in the right direction. But much more work remained to be done.

The broader landscape

It is rather staggering to think of just how wide-ranging and productive Sylvan's philosophical enquiries were around this time. He had arrived at the Australian National University, Canberra, in 1971. He was soon joined by Malcolm Rennie and, in 1974, Bob Meyer arrived to join Sylvan and pursue work on relevant logics. Goddard also headed there on leave from St Andrews to continue work with Sylvan after their days together at the University of New England (in New South Wales), and the Canberra Logic Group grew. Goddard recalled that:

> [i]n a very short time, the ANU Department under John Passmore became a major world centre in relevance logic. So much so that when I arrived there in 1974 for a two-year visit, I was greeted in the corridor by a plaintive Stanley Benn who groaned good-naturedly as he said "Not another bloody logician!" ... Poor Stanley must have felt that it was raining logicians and he had been caught without an umbrella. The rains continued for several years as visitors and students came from all over Australia and the world.[2]

[1] $EMJB_2$ this volume, p. 456.
[2] Goddard 1992, p. 178.

In 1975 the Group was further bolstered by Graham Priest's arrival at the University of Western Australia, and he became a regular contributor and collaborator. Other regular members included Ross Brady, Errol Martin, Michael McRobbie, Chris Mortensen, John Slaney, and Paul Thistlewaite.

In terms of overall output, in the decade 1971-1980 the Canberra Logic Group published 124 articles and 5 books. By 1986 its output amounted to 175 articles, 16 monographs and 7 books.[1] While this research program in logic was galloping along, alongside other work in modal logic that he was engaged in with Hugh Montgomery, and while he was working away on logical, metaphysical and epistemological issues that he would eventually articulate in the Jungle Book – publishing twenty associated journal articles from the ANU in the decade before the Jungle Book appeared – Sylvan was simultaneously pioneering an entirely new field of philosophy with Plumwood.

Environmental philosophy had been emerging as an area on the teaching curriculum in the USA for a few years, but 1973 is generally acknowledged as the year that it emerged as a research field. In that year both Sylvan and the Norwegian philosopher Arne Naess published papers that were squarely aimed at the defence of a "new, environmental ethic" and that stimulated much discussion and further work across the globe.[2] New journals devoted to the field were started, and in Australia alone Sylvan and Plumwood's work in the area spawned conferences, articles and edited collections focusing on their controversial views.

Together, Sylvan and Plumwood had been moved to write on environmental issues (under the names Routley and Routley) when they became aware of national forestry plans to clear five million acres of Australian hardwood forest to make way for a softwood pine industry. They responded within two years with an economic, social and environmental critique of national policy that was published by the Australian National University Press, *The Fight For the Forests*, in 1973. Published in the face of considerable opposition from the industry and the University, the book was reprinted three times in ever-expanding editions (from 290 pages to 400 pages in its third edition), and all editions

[1] *Ibid.*, p. 179.

[2] Cf. Naess 1973 and Routley 1973. It is here that Sylvan's famous "Last Man Example" is first presented, a counter-example to "the prevailing Western ethical systems", that he eventually took as grounds for the broad extension of "intrinsic value" beyond humans.

sold out. Pugilistic and utterly uncompromising in its tone, the book was both revered and reviled, depending on which side you were on.[1]

Those sympathetic to forestry interests were outraged, and Sylvan and Plumwood were vilified as "ill-mannered and ill-informed eco-louts". As the former Head of the Commonwealth Forestry Economics Research Unit, Neil Byron, later commented, "it angered the foresters that two people who had never studied economics or forestry could produce the most incisive and devastating economic analysis of forestry, of plantation development and woodchipping that has ever been done in Australia".[2] Industry insiders who assisted the Routleys with information were considered traitors and their careers threatened. But the book's value was clear. Environmental historian William Lines was not alone in his praise.

> No Australian author or authors had ever combined philosophical, demographic, economic, and ecological analysis in one volume as part of one connected argument. The Routleys were unique. They challenged conventional academic boundaries as barriers to understanding and dismissed claims to objectivity as spurious attempts to protect vested interests. They exposed both wood-chipping and plantation forestry as uneconomic, dependent on taxpayer subsidies, and driven largely by a "rampant development ideology".[3]

While the book had the practical effect of undermining the immediate threat posed by the forest-clearing program and shifting the boundaries of industry accountability and practice in Australia, it was merely the applied outcome of an emerging underlying environmental philosophy for which Sylvan and Plumwood were to become well-known. Between the publication of *The Fight For the Forests* and the Jungle Book they were circulating ground-breaking papers in this new field of environmental philosophy, developing arguments against anthropocentric, "human chauvinist" traditional ethics as well as associated papers in social and political theory with an environmental focus. Associated work on applying noneism in these areas, amongst others, appears in the Jungle Book

[1] For more on this remarkable episode in public policy analysis and attempts at its suppression see: Hyde 2014, chapter 2.
[2] Byron 1999, p. 53.
[3] Lines 2006, pp. 144–45

(especially chapter 8, section 11; reprinted in $EMJB_2$) and elsewhere (e.g. Sylvan 1986 and Routley and Routley 1980).

In fact, Sylvan also drew heavily on Meinong's work in value theory, as well as metaphysics. He thought that "[i]n very many respects ... Meinong, as usual, told it like it is, provided an accurate account of the way of values, and in so doing avoided the familiar shoals of value theory."[1]

Conferences largely spurred by their work in environmental philosophy resulted in the 1980 publication of the edited collection *Environmental Philosophy*, containing two one-hundred page papers by Sylvan and Plumwood, alongside papers by others focussed on their views. This was all alongside papers in applied ethics critiquing the nuclear energy industry, with important contributions to arguments concerning future generations, papers in political philosophy defending anarchism, and sundry other topics that popped up.

It was a busy decade leading up to the publication of the Jungle Book. And between 1975 and 1980, most of the work was written up in a tent, and later a shed, in the forest on Plumwood Mountain 100kms east of Canberra, where Sylvan and Plumwood were building a stone house and a lifestyle compatible with their increasingly counter-cultural attitudes and philosophy.

One reason that Richard and Val spent much of their lives from 1975 onwards living in the forests outside of Canberra was that they found such profound pleasure in them. They marvelled at their ecology and the wonder of their inhabitants. Goddard remembered Richard as

> the good companion ... telling me the names of all the trees, flowers and grasses, collecting seeds, and leading me to lyrebirds' nests. He took such a delight in nature, not so much the delight that a romantic might take in the overall beauty of it all, but a delight in its richness and complexity, in the detail that he found in the structure of mosses and in the behaviour of insects. I too liked walking, and I liked the forest and most natural things, but I have never had the eyes that he

[1] Sylvan 1986, p. 12.

> had, to see it as he did. It's as if in a strange way he was part of it, and in a way that I could never be.[1]

But in the forest they also found what they took to be an ethically acceptable way of living that was consistent with their emerging philosophical views and which they thought was largely compromised in our modern cities. These forests had value in themselves, which Sylvan enjoyed, but were also a valuable means to a satisfactory life, he thought (and argued at length – see Sylvan and Bennett 1994, for example).

Of these forests, rainforests held a special place for him. In them, biodiversity reached a peak and he studied them at length and campaigned for their protection at a time in Australian history when they were coming under assault from the modernised industrial-forestry complex. The intensifying forestry industry, that included the emerging practice of wood-chipping entire swathes of ancient forest, saw these forests through the lens of what he and Plumwood called "the wood-production ideology" – the view of the forests solely in terms of their value for wood-production to the exclusion of other values.

This negative view and consequent reduction through logging of such complexity and diversity as was to be found in the rainforests served as a powerful metaphor, Sylvan thought, for the negative appraisal and consequent attempts at reduction of the complexity and diversity of noneist metaphysics. What was intended as disapprobation in the mouths of his opponents, describing both the rainforest and Meinongian metaphysics as a "jungle", he saw, on the contrary, as approbation.

> Meinong's theory provides a coherent scheme for talking and reasoning about all items, not just those which exist, without the necessity for distorting or unworkable reductions; and in doing so it attributes ... features to nonentities – not merely to possibilia but also to impossibilia. It is these aspects, in particular, of Meinong's theory which have given rise to severe criticism, especially from empiricists: it is claimed that nonentities, especially impossibilia, are hopelessly chaotic and disorderly, that their behaviour is offensive and their numbers excessive. For most philosophers, Meinong is a bogeyman, and Meinong's theory of objects a treacherous, dangerous and over-

[1] Goddard, in a speech to the Memorial Gathering for Sylvan upon his death, ANU June 24 1996.

> lush environment to be avoided at all philosophical costs. These are the attitudes which underlie remarks about "the horrors of Meinong's jungle" and many others in a similar vein ... For these sorts of bad philosophical reasons Meinong's theory is generally regarded as thoroughly discredited ...[1]

And, similarly, the devalued rainforests – seen by many as chaotic, disorderly and decidedly inhospitable – were mere "jungles" ripe for elimination or reduction. But for Sylvan there was nothing "mere" about jungles. Both Meinong's and those under threat from logging were valuable, and their values could be articulated and defended. As he says in the epigraph to the Jungle Book:

> To those who have troubled to learn its ways, the jungle is not the world of fear, danger and chaos popularly imagined and repeatedly portrayed by Hollywood, but a complex, beautiful and valuable biological community which obey's discoverable ecological laws. So it is with Meinong's theory of objects, which has been disparaged, under the "jungle" epithet, as a place to be avoided or razed. Indeed the theory of objects *does* share some of the beauty and complexity, richness and value of a jungle: the system is not chaotic but conforms to precise logical principles, and in resolving philosophical problems, both longstanding and new, it is invaluable.

So it was that he decided, at the height of what have become known as the "forest wars" of the 1970s and 1980s on east-coast Australia, to include photographs of these analogously "rich and complex" systems in the printing of the Jungle Book. The cover consisted of the book's title printed over a copy of M.C. Esher's 'Another World' superimposed on a photograph of rainforest, and further photographs, sourced from recognised landscape photographers Henry Gold and Colin Totterdell, were used on separator pages ending chapters 1, 2, 6, 7, 10, 11, and the book's Bibliography.

[1] $EMJB_2$ this volume, p. xlii.

Beyond the Jungle Book

Though Sylvan thought that much of his work was merely the beginning of a decent alternative to orthodox philosophical positions in logic, metaphysics and value theory (to name a few), and that it was "early days" with many outstanding problems and much more work needed, he was remarkably consistent in the direction of his intellectual development. The search, in particular, for logics capable of removing the defects of orthodox logical theory through weakened paraconsistent, paracomplete and intensional approaches, and for suitable metaphysical foundations capable of accommodating non-existent items, intensional items, impossibilia and other classically-anomalous objects of thought and talk was persistently pursued from these earliest days right through to his death. His last published paper before his death (reprinted in this volume, chapter 3) was a yet-further development of item-theory – what he sometimes called "deep-item theory" or "sistology"[1] – extending beyond the views expressed in the Jungle Book, to accommodate his pluralist turn, amongst other things: a development that began to emerge in the mid-1980s.[2]

His other major intellectual pursuit, an adequate environmental philosophy (including ethics, meta-ethics, political and social philosophy) capable of delivering environmental justice beyond the human sphere, was also dovetailed to the non-classical logic and metaphysics he saw as fundamental to so much philosophical inquiry (alongside the largely autonomous realm of ethics, where he endorsed the fact/value distinction). The logical analyses and noneist metaphysics that he developed were subsequently employed in semantical analyses of value, metaphysical analyses of value-properties, etc.[3] This work, too, displayed remarkable consistency. From his first (groundbreaking) work on the topic in Routley 1973 he – again with Plumwood as collaborator until the early 1980s – pursued a similarly eclectic, unorthodox position, set against nearly all others in the field, developing an intellectual trajectory that seemed unerring in its general course.[4]

[1] Cf. Sylvan 1991.

[2] For a comprehensive account of his distinctive species of pluralism, see Sylvan 1997. And for further discussion see the Casati essay in this volume.

[3] For a clear example of just how thoroughly some of his technical logical theory played a role in his value theory see Routley and Routley 1983.

[4] See Sylvan and Bennett 1994 for a mature account of what Sylvan came to call his "deep-green theory".

This consistent development of themes and ideas from his earliest days reflects the fact that his systematic and decidedly unorthodox philosophy constituted what Lakatos would call a "progressive research program". So long as it continued to offer novel solutions to philosophical problems and continued to throw up new ones, there was good reason to continue to pursue the development of his very broad philosophical system. And he did so until his early death at the age of 60, in 1996.

As time went on he spent less and less time describing the flaws in orthodox approaches to the problems that interested him, and more and more time developing his theories, ideas and systems – declaring in the early 1990s, for example, "I will never read Quine again!". The negative theses, taking issue with those whom he thought got things wrong, increasingly gave way to positive theses, developing and defending his preferred position. Having already marked out an heterodox position in range of fundamental areas like logic, metaphysics and ethics, his subsequent development of a broad over-arching philosophical position built on these foundations. For example, his late work in sistology builds on his earlier neo-Meinongian work; his late work on what he called "sociative logics", or "broadly relevant logics", builds on earlier non-classical, especially relevant, logic[1]; and his late work in environmental philosophy builds on his earlier work in meta-ethics, some of his earlier work in logic, and some of his earlier work in metaphysics.

Such an heterodox, complex and unified philosophy is – like the jungle – sometimes daunting to the outsider. Sylvan himself was not unaware of this problem with respect to the Jungle Book, in particular: "the explanation of item-theory in [that book] was undoubtedly excessively forbidding, by prevailing philosophical standards. The sheer length ... scared many people, symbols deterred others ..."[2] And, at the time of his death some thirty years after first publishing on the topic, he was preparing a new, "simplified" account – Sylvan 1995. Nonetheless, the Jungle Book remains a remarkably audacious and exciting work, with few rivals in the modern philosophical landscape. Despite its problems, the effort to engage with it is worth the reward.

While some philosophers continue to work on this neo-Meinongian project (see, for example, Priest 2005), Sylvan's means of dissemination of the Jungle Book has presented a further barrier to its careful consideration and evaluation. We hope that this more

[1] For some of this work see Sylvan 2000.
[2] Sylvan 1995, "Prologue".

mainstream means of access will help remove that barrier, at least, and encourage a broader consideration of this work.[⋆]

[⋆] Special thanks go to Filippo Casati for additional archival material, as well as numerous delightful and informative conversations about Sylvan's unpublished late work.

References

$EMJB_1$ Routley, R., *Exploring Meinong's Jungle and Beyond*, Research School of Social Sciences, Australian National University, 1980.

$EMJB_2$ Routley, R. et al., *The Sylvan Jungle*, edited by M. Eckert et al., vol. 1–4, Springer Verlag, Berlin, forthcoming.

Brady, R., *Relevant Logics and their Rivals II. A Continuation of the Work of Richard Sylvan, Robert Meyer, Val Plumwood and Ross Brady*, Ashgate, Aldershot, 2003.

Byron, N., "Forestry as if economics mattered", in *The People's Forest. A Living History of the Australian Bush*, edited by Greg Borschmann, Canberra, People's Forest Press, 1999, 49–59.

Goddard, L., "A personal view of the development of deductive logic in Australia since 1956", in *Essays on Philosophy in Australia*, edited by J. Srzednicki and D. Wood, Dordrecht, Kluwer, 1992, 169–185.

Hyde, D., *Eco-Logical Lives. The Philosophical Lives of Richard/Routley Sylvan and Val Routley/Plumwood*, White Horse Press, Cambridge, 2014.

Lines, W., *Patriots. Defending Australia's Natural Heritage*, University of Queensland Press, St Lucia, 2006.

Mannison, D., McRobbie, M. and Routley, R., eds., *Environmental Philosophy*, Department of Philosophy Monograph Series #2, Research School of Social Sciences, Australian National University, 1980.

Martin, E., "Logic in Australia", in *Essays on Philosophy in Australia*, edited by J. Srzednicki and D. Wood, Dordrecht, Kluwer, 1992, 187–230.

Naess, A., "The shallow and the deep, long-range ecology movement", *Inquiry* **16** (1973) 95–100.

Priest, G., *Towards Non-Being. The Logic and Metaphysics of Intentionality*, Oxford University Press, Oxford, 2005.

Priest, G., Routley, R. and Norman, J., eds., *Paraconsistent Logic. Essays on the Inconsistent*, Philosophia Verlag, Munich, 1989.

Routley, R., "What numbers are", *Logique et Analyse* **8** (1965) 196–208.

Routley, R., "Some things do not exist", *Notre Dame Journal of Formal Logic* **7** (1966) 251–276.

Routley, R., "Exploring Meinong's jungle I. Items and descriptions", typescript, Sylvan Papers, Fryer Library, University of Queensland, 1967.

Routley, R., "Exploring Meinong's jungle II. Existence and identity when times change", typescript, Sylvan Papers, Fryer Library, University of Queensland, 1968.

Routley, R., "Is there a need for a new, an environmental, ethic?", in *Proceedings of the XVth World Congress of Philosophy, Vol. 1*, Varna, 1973, 205–210. (Reprinted in *Environmental Philosophy. From Animal Rights to Radical Ecology*, (ed. M. Zimmerman *et al.*), Prentice Hall, New Jersey, 1993, pp. 12–21.)

Routley, R., "Universal semantics?", *Journal of Philosophical Logic* **4** (1975) 327–356.

Routley, R., "The semantical metamorphosis of metaphysics", *Australasian Journal of Philosophy* **54** (1976) 187–205.

Routley, R., Meyer, R.K., Plumwood, V. and Brady, R., *Relevant Logics and Their Rivals I. The Basic Semantical Theory*, Ridgeview, California, 1982.

Routley, R. and Routley, V., "Rehabilitating Meinong's theory of objects", *Revue Internationale de Philosophie* **27** (1973a) 224–254.

Routley, R. and Routley, V., *The Fight for the Forests. The Takeover of Australian Forests for Pines, Wood Chips and Intensive Forestry*, Research School of Social Sciences, Australian National University, Canberra, 1973b.

Routley, R. and Routley, V., "Social theories, self management and environmental problems", in *Environmental Philosophy*, edited by M. McRobbie D. Mannison and R. Routley, Canberra, Research School of Social Sciences, Australian National University, 1980, 217–332.

Routley, R. and Routley, V., "Semantic foundations for value theory", *Nous* **17** (1983) 441–456.

Sylvan, R., "The way of values: a free variation of Meinong's theory of impersonal value", in *Three Essayes Upon Deeper Environmental Ethics*, edited by R. Sylvan, Canberra, Discussion Papers in Environmental Philosophy #13, Research School of Social Sciences, Australian National University, 1986, 1–27. (Reprinted in *Essays on Meinong* (ed. P.M. Simons), Philosophia Verlag, Munich, 1992.)

Sylvan, R., "Sistology", in *Handbook of Metaphysics and Ontology*, edited by L. Burkhardt and B. Smith, Munich, Philosophia Verlag, 1991, 837–840.

Sylvan, R., "What *is* wrong with applied ethics", in *Philosophy and Applied Ethics Re-Examined*, Newcastle, Australia, Philosophy Department, University of Newcastle, 1993, 19–30.

Sylvan, R., "Item-Theory – Simplified, Streamlined, and Further Applied Structure", unpublished typescript, Sylvan Papers, folder #1234, Fryer Library, University of Queensland, 1995.

Sylvan, R., *Transcendental Metaphysics: from radical to deep plurallism*, The White Horse Press, Cambridge, 1997.

Sylvan, R., *Sociative Logics and Their Applications. Essays by the Late Richard Sylvan*, Ashgate, Aldershot, 2000. Edited by D. Hyde and G. Priest.

Sylvan, R. and Bennett, D., *The Greening of Ethics. From Human Chauvinism to Deep-Green Theory*, The White Horse Press, Cambridge, 1994.

Sylvan, R. and Hyde, D., "Ubiquitous vagueness without embarrassment: logic liberated and fuzziness defuzzed (i.e. respectabilized)", *Acta Analytica* **10** (1993) 7–29.

ORIGINAL MATERIAL

First Edition Front Matter

To
Hugh Montgomery
and Malcolm Rennie,
friends and fellow-workers
in past logical investigations

To those who have troubled to learn its ways, the jungle is not the world of fear, danger and chaos popularly imagined and repeatedly portrayed by Hollywood, but a complex, beautiful and valuable biological community which obeys discoverable ecological laws. So it is with Meinong's theory of objects, which has often been disparaged, under the "jungle" epithet, as a place to be avoided or razed. Indeed the theory of objects *does* share some of the beauty and complexity, richness and value of a jungle: the system is not chaotic but conforms to precise logical principles, and in resolving philosophical problems, both longstanding and new, it is invaluable.

Preface and Acknowledgements

> A fundamental error is seldom expelled from philosophy by a single victory. It retreats slowly, defends every inch of ground, and often, after it has been driven from the open country, retains a footing in some remote fastness (Mill 1947, pp. 73–4).

The fundamental philosophical error, common to empiricism and idealism and materialism and incorporated in orthodox (classical) logic, is the Reference Theory and its elaborations. It is this theory (according to which truth and meaning are functions just of reference), and its damaging consequences, such as the Theory of Ideas (as Reid explained it), that noneism – in effect, the theory of objects – aims to combat and supplant. But like Wittgenstein (in Wittgenstein 1953), and unlike Mill, noneists expect no victories against such a pervasive and treacherous enemy as the Reference Theory. Though noneists take it for granted that "Truth is on their side", and reason too, the evidence that "Truth and reason will out" is exceedingly disappointing. Nor do they expect the enemy to vanish, even from open country: fundamental error will no doubt persist, to the detriment of philosophy, and of every theoretical and practical subject it touches. For there is great resistance to changing the framework (to amending the paradigm); so there is an attempt to handle everything within the prevailing philosophical frame. There is no need, it is thought, to change the framework, all problems can eventually be solved within the basic referential scheme – at worst by some concessions[1] which absorb some nonreferential fragments, and thereby decrease both the level of dissatisfaction with the going frame, and the prospects for perception of its real character.

The faith that the Reference Theory (and its forms such as extensionalism and empiricism) will find a way out of its impasses, a way to deal adequately with nonexistence and intensionality, is like the faith that technology will find a way to deal with social problems, especially with all the problems it creates (the faith is deeply embedded in the Technocratic Ideology). As with the Technocratic Ideology so with the Reference Theory, the Great Breakthrough which will resolve these problems, (patently) not soluble within the technological or referential framework, is always just around the corner, no matter how discouraging the record of failures in the past. The problems, difficulties, and fail-

[1] An example of theoretical cooption is the (somewhat grudging) toleration of lower grades of modality and intensionality – which can however be referentially accounted for, more or less.

ings of the Theory are not recognised as reasons for rejecting it and adopting a different theoretical and ideological framework, but are presented as "challenges", which further work and technology will doubtless find a way to resolve. And as with Technocracy the "solution" of a problem in one area is liable to create a rash of new problems in other areas (e.g. increasing energy supply at the expense of increased pollution, forest destruction, etc.), which can, however, for a time at least, be conveniently overlooked in the presentation of the "solution" as yet another triumph for the theory and its ideology. That is, the procedure is to trade in one problem for another, and hope that nobody notices.

The basic failings of the Reference Theory are at the logical level. The Reference Theory yields classical logic, and directly only classical logic: in this sense classical logic is the logic of the Reference Theory. An important group of elaborations of the Reference Theory correspond in the same way to logics in the Fregean mode. Accordingly with the breakdown of the Reference Theory and its elaborations all these logics fail; and so, as with the breakdown of modern energy supplies, substantial adjustment and reconstruction is required. In fact no less than the effects of a logical revolution are called for (see RLR), though the aim of these essays is to achieve such results in a more evolutionary way, to take advantage of the classical superstructure, to build the new logic in part on what there is. The logical areas where change and improved treatment are especially, and desperately, needed are these:

nonexistence and impossibility;
intensionality;
conditionality, implication and deducibility;
significance; and
context.

It is on the first two overlapping areas, the very shabby treatment of which is a direct outcome of the Reference Theory, that the essays which follow concentrate. (The remaining areas – which are, as will become quite evident, far from independent – are treated, still in a preliminary way, in two companion volumes to this work, RLR and Slog, and in other essays.) When the Reference Theory and its elaborations (such as Multiple Reference Theories) are abandoned the role of logic changes – its importance need not however diminish.

A special canonical language into which all clear, intelligible, worthwhile, admiss-

ible, . . . , discourse has to be paraphrased is no longer required. Not required either is a professional priesthood to administer the highly inaccessible canonical technology for transforming into an acceptable intellectual product what can be salvaged from the language of natural speech and thought. Natural languages, accessible to and used by all, are more or less in order as they are, and logical investigation can be carried on, as indeed it usually is (the Reference Theory having its Parmenidean aspects), in extensions of these.

In a social context, the canonical language of classical logic can be seen as something of an ultimate in professionalisation. Its goal is the delegitimisation of the most basic and accessible natural tool of all – natural language and the reasoning and thought expressed in it – and its *replacement* by a new, special, highly inaccessible and professionalised language for thought and reasoning, which alone can lay claim to clarity, logical soundness, and intellectual respectability. In contrast the alternative approach does not set out to replace or delegitimise the language of natural speech and thought; it is rather an extension and systematisation of natural language, and to some extent a theory of what can be truly said in it.

The role of semantics also changes: for natural language can furnish its own semantics, and semantics for logical extensions can also be accommodated into this framework. But the need for logic does not vanish with its changing role. Its importance remains for the precise formulation of theories, especially philosophical theories, and for their assessment, for the establishment of their coherence and adequacy in various logical respects, or for the demonstration of their inadequacy. And it retains its traditional importance for the assessment of arguments and analyses, and in the detection of fallacies.

Logic thus remains central to philosophy: for an important part of philosophy consists in argument and the giving of reasons and the location of fallacies and of gaps; and logic supplies and assesses the methods of reasoning and argumentation, exposes the assumptions and hidden premisses, and determines what the fallacies are and where they occur. Any substantial change in logical theory is therefore likely to have far-reaching effects throughout the remainder of philosophy. The impact, in this direction, on philosophy will, however, be slightly less catastrophic than might be anticipated, for this reason: many parts of philosophy no longer entirely rely on the defective methods furnished by received logical theory.

No, the main impact of the abandonment of the Reference Theory and its elaborations comes not through the new logic, but in other less expected ways. Firstly, the Reference Theory (or but a minor extension thereof) is an integral part of the main philosophical positions of our times, of empiricism and idealism and materialism. Seeing through the Reference Theory is a fundamental step in seeing through these positions and *in escaping the problems they generate* (in removing their problematics). Secondly, and connected with this, the Reference Theory and its elaborations reappear, in only thinly disguised forms, in the standard spectra of proposed solutions to such apparently diverse philosophical problems as those of universals, perception, intentionality, substance, self, and values. Noneism, by rejecting the basic assumptions, common to the standard, but invariably unsatisfactory, proposed solutions to the problems, casts much fresh light on all these perennial philosophical "problems".

The Reference Theory and its elaborations are considered in much detail, then, not merely because these theories are responsible for setting philosophy on a mistaken course, but also because the referential moves of these theories are re-enacted in many other philosophical areas, indeed in every major philosophical area. The same mistaken philosophical moves, deriving from the Reference Theory and its elaborations, appear over and over again in different philosophical arenas. In later chapters we shall see these moves made in metaphysics, in epistemology, in the philosophy of science; but they are also made in ethics, in political theory, and elsewhere, in each case with serious philosophical costs.

In sum, both received logical theory *and* mainstream philosophical thinking involve, according to noneism, fundamentally mistaken assumptions, especially those of the Reference Theory and its reflections in other areas. In part the essays which follow are devoted to exposing these assumptions, to arguing their inadequacy in detail and to showing how they have generated very many spurious philosophical and logical problems, and effectively diverted philosophical investigation into hopeless deadends. In part the essays are positive: they are concerned with the investigation of alternative theories and, in particular, the construction of one important alternative sort of theory, noneism, and with showing how that theory, by transposing the setting of philosophical issues, eliminates or greatly reduces in severity the usual philosophical problems and impasses. There are, however, no philosophical ways without problems, and each new theory generates its own set. Noneism is no exception; it has already problems of its own (though they are,

for the most part, not where critics have located them). Nevertheless it would be pleasant if the new theory (which is really only a higher tech but still low impact elaboration of older, but minor, theories) were an approximation to a part of – the central part of – the correct philosophical theory, of the truth.

Among the main problems to be explored are those of the logical behaviour of nonentities; in particular, the problem of precisely which properties and sorts of properties things which do not exist have, and the problem of the logical behaviour of objects (whether they exist or not) in more highly intensional settings, e.g. of criteria for identity. Some of these problems are old and were of concern to many philosophers in the past, e.g. riddles of nonexistence and problems of how nonentities have properties and which ones they have: but many of the problems are new. Although these main problems can now be seen as part of the semi-respectable subject of semantics, western philosophers seem to have been lulled into complacency about them by the generally prevailing empiricist climate. In semantical terms the central problem is that of explaining the truth of nonreferential statements (of intensional statements and of statements apparently about nonentities), explaining which types of such statements are true, and what the status of those which are not true is – in short, providing a semantical theory which can account, without distortion of their meaning, for their truth.

One measure of the modern philosopher's complacency about these central problems is that it has become standard to regard the most basic of them as having been rather satisfactorily dissolved, if not by Russell's theory of descriptions and proper names, then by one of its minor referential variations such as Strawson's theory or Quine's theory or, to be more up to date, Donnellan's theory or Putman's theory or Kripke's theory. Russell's theory, students are taught, is a philosophical paradigm which has resolved these ancient problems and confusions once and for all, rendering unnecessary the investigation of alternative solutions.[1] But once these problems are taken seriously the empiricist dogmas which currently pass for final solutions to them can be seen to be far from satisfactory and to depend crucially on dismissing or ignoring the new problems and difficulties which arise over the supposed reanalyses of the problematic statements. These problems must however be taken as fundamental, they cannot be explained away as pseudo-problems or dismissed as unscientific or not worth bothering about, and the problematic statements

[1] The common idea that it is a paradigm of philosophical analysis comes from Ramsey 1931, p. 263 n.

present important data that any adequate theory of language, truth, and meaning must give a satisfactory explanation of. No referential theory succeeds in accounting for this data.

The widespread but mistaken satisfaction with classical logical theory (essentially Russell's theory) has led to a failure to search for radical alternatives to it or to assess carefully earlier radical alternatives. A main theme of the essays [contained here in Volume 1 and subsequent Volumes 2, 3 and 4 *—Eds.*] is that a theory with a good deal in common with Meinong's theory of objects, but in a modern logical presentation, offers a viable alternative to classical logical theories, to modern theories of quantification, descriptions, identity, and so on, and provides a superior account of the crucial data to be taken account of.

Meinong's theory provides a coherent scheme for talking and reasoning about *all* items, not just those which exist, without the necessity for distorting or unworkable reductions; and in doing so it attributes, it is bound to attribute, features to nonentities – not merely to possibilia but also to impossibilia. It is these aspects, in particular, of Meinong's theory which have given rise to severe criticism, especially from empiricists: it is claimed that nonentities, especially impossibilia, are hopelessly chaotic and disorderly, that their behaviour is offensive and their numbers excessive. For most philosophers, Meinong is a bogeyman, and Meinong's theory of objects a treacherous, dangerous and overlush environment to be avoided at all philosophical costs. These are the attitudes which underlie remarks about "the horrors of Meinong's jungle" and many others in a similar vein which most of those who have written on Meinong have felt the urge to construct. For these sorts of bad philosophical reasons Meinong's theory is generally regarded as thoroughly discredited: and until very recently no one has bothered to look very hard at the formal structure of theories of Meinong's sort, or to examine the sort of alternative they present to Russellian-style theories.

A popular variation on rubbishing Meinong's theory is misrepresenting it, often by importing assumptions drawn from the rival Russellian (or Fregean) theory, so that it can be made to appear as an extravagant platonistic version of that theory and one whose "ontology" includes any old impossible objects. Platonistic construals of the theory of objects are entirely mistaken.

The alternative nonreductionist theories of items developed in what follows – which differ from Meinong's theory of objects in *many* important respects – are, hopefully, less open than Meinong's to misconstrual and misrepresentation of these sorts (of course, no theory is immune). But chicanery of these and other kinds is only to be expected; for it is by sophistical means, and not in virtue to truth and reason, that the Reference Theory will maintain its classical control over the logical landscape.

* * * * * *

My main historical debt is of course to the work of Alexius Meinong. But, as will become apparent, I am also indebted to the work of precursors of Meinong, in particular Thomas Reid. I have been much helped by critical expositions of Meinong's work, especially Findlay 1963, and, in making recent redraftings of older material, by Roderick Chisholm's articles. I have been encouraged to elaborate earlier essays and much stimulated by recent attempts to work out a more satisfactory theory of objects than Meinong's mature theory, in particular the (reductionist) theories of Terence Parsons. That I am, or try to be, severely critical of much other work on theories of objects in no way lessens my debt to some of it.

Among my modern creditors I owe most to Val Routley, who jointly authored some of the chapters (chapters 4, 8 and 9 [reprinted in Volume 2 and Volume 3 *—Eds.*]), and who contributed much to many sections not explicitly acknowledged as joint. For example, the idea that the Reference Theory underlay alternatives to the theory of objects and generated very many philosophical problems, was the result of joint work and discussion.

I have profited – as acknowledgements at relevant points in the text will to *some* extent reveal – from constructive criticism directed at earlier exposure of this work, in particular extended presentations in seminar series at the University of Illinois, Chicago Circle, in 1969, at the State University of Campinas in 1976, and at the Australian National University in 1978.

On the production side I have been generously helped, in almost every aspect from initial research to final proofing and distribution, by Jean Norman, without whose assistance the volume would have been much slower to appear and much inferior in final quality. Many people have helped with the typing, design, printing, organisation, financing and distribution of the text. To all of them my thanks, especially to Anne Van

Der Vliet, who did much of the typing of the final version, often from very rough copy, and to Brian Embury who contributed much to the final stages of production.

* * * * * *

Although a book of this size has (inevitably) involved much labour over a long period, the result remains far from satisfactory at a good many points. For these lapses I beg a modicum of tolerance from the (perhaps hostile) reader. It is partly this remaining unsatisfactoriness, partly because overlap between sections of the book has not been entirely eliminated, partly because despite the burgeoning length of the book the investigation of several crucial matters for noneism remains incomplete or yet to be worked out properly, and partly because of the format, that the production is presented as an interim edition. It may be that the project will never progress beyond that stage; but I was determined – and finally forced by a deadline – to achieve a clearing of my desks, and to try to organise folders full of (sometimes stupid and often repetitious) notes and partly completed manuscripts into some sort of more coherent, intelligible, and accessible whole. In the course of this organisation I have drawn on much earlier work, which has shaped the format of the present edition.

Firstly, some of the essays which follow are redraftings, mostly with substantial changes and additions, of previous essays, which they supersede. Main details are as follows:

Chapter 1 [i.e. the material reprinted in Volume 1 *—Eds.*] incorporates the whole of "Exploring Meinong's Jungle", cyclostyled, 116 pages plus footnotes, completed in 1967, subsequently re-entitled "Exploring Meinong's Jungle. I. Items and descriptions". A shortened version of the paper (55 pages comprising roughly the first half of the original paper) was prepared for publication under the latter title, and was accepted by the *Australasian Journal of Philosophy*. But owing to my growing dissatisfaction with the paper requisite minor revision and retyping of the shortened paper was never undertaken. In later parts of chapter 1 passages from earlier papers are borrowed: the main object of these and other borrowings in subsequent chapters has been to make the book rather more independent of work published elsewhere.

Chapter 2 [reprinted in Volume 2 *—Eds.*] – which has not been subject to nearly as much revision as it deserves – incorporates virtually all of "Existence and identity when times change", a 69 page typescript from 1968. The paper was subsequently re-

entitled "Exploring Meinong's Jungle. II. Existence and identity when times change". Professor Sobocinski kindly offered in 1969 to publish both parts, I and II, of "Exploring Meinong's Jungle" in the *Notre Dame Journal of Formal Logic*. Perhaps fortunately for other contributors to the Journal, part II was never submitted in final form, and part I has recently been withdrawn.

Parts of several of the newer essays [included in Volumes 2, 3 and 4 —*Eds.*] have been published elsewhere; *Chapter 3* [reprinted in Volume 2 —*Eds.*] in *Philosophy and Phenomenological Research*; *Chapter 6* [reprinted in Volume 2 —*Eds.*] in *Grazer Philosophische Studien*; *Chapter 7* [reprinted in Volume 2 —*Eds.*] in *Poetics*; *Chapter 8* [reprinted in Volume 3 —*Eds.*] in *Dialogue*; the *Appendix* (referred to as UL [reprinted in Volume 4 —*Eds.*]) in *The Relevance Logic Newsletter*; while some of *Chapter 4* [reprinted in Volume 2 —*Eds.*] has previously appeared in *Revue Internationale de Philosophie*, the remainder of the paper involved (referred to as Routley[2] 1973) being largely taken up in Chapter 1.[α] Excerpts from earlier articles on the logic and semantics of nonexistence and intensionality and on universal semantics have also been included in the text; these are drawn from the following periodicals: *Notre Dame Journal of Formal Logic* (papers referred to as EI, SE, NE), *Philosophica* (MTD), *Journal of Philosophical Logic* (US), *Communication and Cognition* (Routley[2] 1975), *Inquiry* (Routley 1976), and *Philosophical Studies* (Routley 1974). Permission to reproduce material has been sought from editors of all the journals cited, and I am indebted to most editors for replies granting permission.

Parts of many of the essays have been read at conferences and seminars in various parts of the world since 1965 and some of the material has as a result (and gratifyingly) worked its way into the literature. It is pleasant to record that much of the material is now regarded as far less crazy and disreputable than it was in the mid-sixties, when it was taken as a sign of early mental deterioration and of philosophical irresponsibility.

* * * * * *

References, notation, etc. Two forms of reference to other work are used. Publications which are referred to frequently are usually assigned special abbreviations (e.g., SE, Slog); otherwise works are cited by giving the author's name and the year of publication.

[α] Jack Smart was fond of saying that if one read nothing else by Richard on Meinong and noneism, one should read Routley[2] 1973. It was this, he said, that enabled him to finally understand Richard and Val's views on Meinong. —*Eds.*

In case an author has published more than one paper in the one year the papers are ordered alphabetically.

The bibliography records only items that are actually cited in the text. Also included however is a supplementary bibliography on Meinong and the theory of objects (compiled by Jean Norman) which extends and updates the bibliographies of Lenoci 1970 and Bradford 1976. Delays in production made feasible – what was always thought desirable (as even the *authors* of Slog have repeatedly found) – the addition of an index: this too was compiled by Jean Norman.

In quoting other authors the following minor liberties have been taken: notation has been changed to conform with that of the text, and occasionally passages have been rearranged (hopefully without distortion of content). Occasionally too citations have been drawn from unfinished or unpublished work (in particular Parsons 1978 and Tooley 1978) or even from lecture notes (Kripke 1973): sources of these sorts are recorded in the bibliography, and due allowance should be made.

Standard abbreviations, such as "iff" for "if and only if" and "wrt" for "with respect to", are adopted. The metalanguage is logicians' ordinary English enriched by a few symbols, most notably "$\rightarrow$" read "if ... then ..." or "that ... implies that ...", "&" for "and", "$\vee$" for "or", "$\sim$" for "not", "P" for "some" and "U" for "every". These abbreviations are not always used however, and often expressions are written out in English.

Cross references are made in obvious ways, e.g. "see 3.3" means "see chapter 3, section 3" and "in §4" means "in section 4 (of the same chapter)". The labelling of theorems and lemmata is also chapter relativised. Notation, bracketing conventions, labelling of systems is as explained in companion volume RLR; but in fact where these things are not familiar from the literature or self-explanatory they are explained as they are introduced.

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Notes for prospective readers. By and large the chapters (and even sections) can be read in any order, e.g. a reader can proceed directly to chapter 3 or to chapter 9, or even to section 12.3. Occasionally some backward reference may be called for (e.g. to explain central principles, such as the Ontological Assumption), but it will never require much backtracking.

In places, especially part IV of chapter 1, the text becomes heavily loaded with logical symbolism. The reader should not be intimidated. Everything said can be expressed in English, and commonly is so expressed, and always a recipe is given for unscrambling symbolic notation into English. However the symbolism is intended as an aid to understanding and argument and to exact formulation of the theory, not as an obstacle. Should the reader become bogged down in such logical material or discouraged by it, I suggest it be skipped over or otherwise bypassed.

In the interest of further development of the theory, I should appreciate feedback from readers, e.g. suggestions for improvements, of problems, additional arguments, further objections, and of course copies of commentaries.

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Chapter 1

Exploring Meinong's jungle and beyond
I. Items and descriptions

> ... what is to be an object of knowledge does not in any way have to exist ... . The fact is of sufficient importance for it to be formulated as the principle of the independence of manner of being from existence, and the domain in which this principle is valid can best be seen by reference to the circumstances that there are subject to this principle not only objects which in fact do not exist, but also such as cannot exist because they are impossible. Not only is the oft-quoted golden mountain golden but the round square too is as surely round as it is square ... . (Meinong 1904; also TO, p. 82).

I. Noneism and the theory of items

There is an important, but largely underground, philosophical current running at least from the Epicureans to modern times, with major outflowings in Reid and in Meinong,[1] according to which many of a wide variety of the objects, both individual and universal, that many of us ordinarily talk about and think about, do not exist in any way at all. Thus the Epicureans, early radicals,

[1] The stream also surfaces, sometimes but briefly, in the work of Abelard, of William of Shyreswood, of Descartes (who introduced a nonexistential particular quantifier, *datur*), of Mill (who, while insisting upon existentially loaded quantification, qualified the Ontological Assumption) and, more recently, of Curry and Lejewski – and presumably elsewhere. I should like to obtain fuller documentation of the history of noneism, and would welcome details from those who have them or can locate them. Not all the tributaries of the stream are confined to western philosophy. Leading theses of noneism also emerge, as it appears, in the thought of some Buddhist logicians: cf. Matilal 1971, chapter 4.

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> deprive many important things of the title of "existent", such as space, time, and location – indeed the whole category of lekta (in which all truth resides); for these, they say, are not *existents*, although they are something (Plutarch "*Adversus Colotem*", 1116 B).

The same theses will be defended in what follows. None of space, time or location – nor, for that matter, other important universals such as numbers, sets or attributes – exist; no propositions or other abstract bearers of truth exist: but these items are not therefore nothing, they are each something, distinct somethings, with quite different properties, and, though they in no way exist, they are objects of discourse, of thought, and of quantification, in particular of particularisation. Similar theses are to be found in Reid, in whose work they obtain much further elaboration:

> ... we have power to conceive things which neither do nor ever did exist. We have power to conceive attributes [universals, ideas] without regard to their existence. The conception of such an attribute is a real and undivided act of the mind; but the attribute conceived is common to many individuals that do or may exist. We are too apt to confound an object of conception with the conception of that object.
>
> ... the Platonists ... were led to give existence to ideas, from the common prejudice that everything which is an object of conception must really exist; and, having once given existence to ideas, the rest of their mysterious system about ideas followed of course; for things merely conceived have neither beginning nor end, time nor place; they are subject to no change ...
>
> These are undeniable attributes of the ideas of Plato; and, if we add to them that of real existence, we have the whole mysterious system of Platonic ideas. Take away the attribute of existence, and suppose them not to be things that exist, but things that are barely conceived, and all the mystery is removed ... (Reid 1895, pp. 403–4).

Just how the mystery is removed, Reid has already explained in detail (see his discussion of the nature of a circle, p. 371).

The position arrived at – hereafter called (basic) *noneism*, also spelt and pronounced "nonism" – is thus neither realism nor nominalism nor conceptualism. It falls

outside the false classifications of both the ancient and modern disputes over universals, since these classifications rest upon an assumption, the vulgar prejudice Reid refers to, which noneism rejects.

By far the fullest working out of these noneist themes – which are firmly grounded in commonsense but tend to lead quickly away from current philosophical "commonsense" – is to be found in the work of Meinong, especially in Meinong's theory of objects, central theses of which include these:

M1. Everything whatever – whether thinkable or not, possible or not, complete or not, even perhaps paradoxical or not – is an object.

M2. Very many objects do not exist; and in many cases they do not exist in any way at all, or have any form of being whatsoever.

M3. Non-existent objects are constituted in one way or another, and have more or less determinate natures, and thus they have properties. In fact they have properties of a range of sorts, sometimes quite ordinary properties, e.g. the oft-quoted golden mountain is golden. Given a subdivision of properties into (what may be called) *characterising* properties and *non-characterising* properties, further central theses of Meinong's can be formulated, namely:

M4. Existence is not a characterising property of any object. In more old-fashioned language, being is not part of the characterisation or essence of an object; and in more modern and misleading terminology, existence is not a predicate (but of course it is a grammatical predicate). The thesis holds, as we shall see, not merely for "exists", but for an important class of ontological predicates, e.g. "is possible", "is created", "dies", "is fictional".

M5. Every object has the characteristics it has irrespective of whether it exists; or, more succinctly, essence precedes existence.

M6. An object has those characterising properties used to characterise it. For example, the round square, being the object characterised as round and square, is both round and square.

Several other theses emerge as a natural outcome of these theses; for example:

M7. Important quantifiers, in fact of common occurrence in natural language, conform neither to the existence nor to the identity and enumeration requirements that classical

logicians have tried to impose in their regimentation of discourse. Among these quantifiers are those used in stating the preceding theses, e.g. "everything", "very many", and "in many cases". A similar thesis holds for descriptors, for instance for "the" as used in "the round square".

The theory of objects – or of *items*, to use a more neutral term – to be outlined integrates, extends, and fits into a logical framework, all the theses introduced from the Epicureans, from Reid and especially from Meinong. Perhaps the most distinctive feature of Meinong's theory – as compared with earlier theories – is that objects are not restricted, as in the usual rationalist theories and in modern modal logic, to possible objects, but are taken to embrace impossible objects, and these impossibilia are also allowed a full role as proper subjects. Thus all logical operations apply to impossibilia as well as to possibilia and entities. And thesis M6 holds for impossibilia: so, for example, Meinong's round square is both round and square, and thus both round and not round. This seems to be the feature of Meinong's theory which has caused most consternation. But though it is a source of difficulty for Meinong it is also the source of great advantages; for it is this feature that enables Meinong to avoid one of the most arbitrary features of rationalism: the limitation of objects to possible objects. Rationalists merely put offto the possibility stage the same sort of problem that faced empiricists at the entity stage, namely the problem of how we manage to make the true statements we do make about objects beyond the pale, in the rationalists' case impossible objects. For intensional operators do not stop short at possibility; and impossible objects may be the object of thoughts and beliefs just as much as possible ones, they may be the subjects of true statements, e.g. in mathematical *reductio* proofs, and so on. There is then a straightforward case for not arbitrarily stopping at possibility; and it is just the extension to impossibilia that entitles Meinong's theory, unlike usual rationalist and platonist theories, to claim to provide a *general* solution to such logical problems as that of quantifying into intensional sentence contexts (i.e. of binding variables within the scope of intensional functors).

From the fact that impossibilia are admitted as proper subjects of true statements along with possibilia, it does not follow that there is no difference between their logical behaviour and that of possibilia. Of course there are differences, but none that excludes either as proper subjects. The traditional and widespread notion that impossibilia are beyond logic or violate the laws of logic, that they are not amenable to logical treatment and cannot be proper subjects, is mistaken.

Although the theory to be outlined has a great deal in common with Meinong's mature theory of objects, and indeed borrows heavily therefrom, it diverges from Meinong's theory substantially as regards objects of higher order, and also on some issues of detail at the lower order. In some respects the theory advanced goes well beyond Meinong's theory; for Meinong scarcely developed the logic underlying his theory of objects, and in fact left some crucial logical issues unresolved and resolved others in an unsatisfactory or unclear fashion, in particular the vital issue of restrictions on the characterisation postulate (effectively M6) and the question of the logical status of paradoxical (or defective) objects. The theory to be presented here, the theory of items, (to invoke "items" now as a distinguishing term), unlike Meinong's theory assigns no being or subsistence to objects of higher order. For example, whereas Meinong speaks of the being and non-being of objectives and the subsistence of many objects which do not exist, the theory of items avoids, and rejects as misguided, such subsistence terminology. Rather the theory follows the Epicureans and Reid in allowing no being whatsoever to propositions, attributes and other abstract objects. Also the jungle we are to explore further was only partly charted by Meinong. For instance, an understanding of the semantical basis of the theory of items and the way it differs from the classical theory requires consideration not only of existence requirements but also of identity requirements, but Meinong scarcely considers modern logical problems concerning identity. Moreover some of Meinong's earlier maps of the jungle made when he still laboured under the influence of empiricism and of Hume and Brentano in particular, contain serious inaccuracies. We should beware of being misled by them, or of too heavy a reliance on Meinong's work.[1]

Even though the theory of items differs in many respects from Meinong's theory of objects, many of the things Meinong wanted to say of objects can be said in the new theory using different, and less damaging, terminology. In particular the new theory abandons entirely Meinong's use of the term "being". But many of the things said using this term can be said in a noncommittal way. Consider objectives (i.e. states of affairs, of circumstances): instead of saying that objectives have being or not, it is enough to say, as Meinong sometimes did, that objectives obtain or not, a matter of whether corresponding propositions are true or not. Consider abstract objects such as numbers: Meinong maintained that though the number two does not exist it has being. On the new theory

[1] A fuller account of differences between the theory of items and Meinong's theory of objects will be given in subsequent essays, especially 12.2 [reprinted in Volume 3 —*Eds.*].

of number, two neither exists nor is assigned being of any sort; however it does have properties, it has indeed a nature. *These shifts* – which *are not merely terminological* since a translation would mirror all properties, while the shifts do not – have a considerable payoff.[1] To begin with, the charge of platonism that has been repeatedly levelled at Meinong's theory, but which Meinong rejected, is more easily avoided. For example, Lambert suggests (Lambert 1973, p. 225) that it is a verbal illusion to suppose that Meinong has clarified or settled the platonism-nominalism issue: "in Meinongian terms, what the platonist asserts and the nominalist denies is that the number two has being *of any kind*." In this sense the theory of items is nominalistic, for the number two has no being of any kind; even so it is an object and can be talked about, irrespective of (what is unlikely) any reduction of the talk to talk about the numeral "two". Meinong's theory, so reexpressed, removes the assumptions upon which the platonism-nominalism issue is premissed: it is no verbal illusion, then, that the theory clarifies, and indeed dissolves, the main issue. What remains is an issue concerning notational economy.

Like most undercurrents which threaten or upset the ideological status quo – in this case a prevailing empiricism, with philosophical rivalry cosily restricted to apparently diverse forms of empiricism, such as idealism, pragmatism, realism and dialectical materialism, the differences between which, like the differences between capitalism and state socialism, are much exaggerated – noneism has been subject to extensive distortion, misrepresentation, and ridicule (and even to suppression), and its logic has been written offas deviant. In particular, as we have already noticed, Meinong's theory of objects has been, and continues to be, the target for a barrage of supposedly devastating criticism and ridicule, which is without much parallel in modern philosophy, so that even to mention Meinong's theory gives rise to amusement, and practically any theory can be condemned by being associated with Meinong (as, e.g., "shades of Meinong!" Ryle 1971, p. 234, "the horrors of Meinong's jungle", "Meinong's jungle of subsistence" Kneale 1949, pp. 32 and 12, "the unspeakable Meinong" James cited in Passmore 1957, p. 187). And the literature abounds with allegedly final refutations of Meinong's theory (thus, e.g. Ryle 1972, "*Gegenstandstheorie* is dead, buried and not going to be resurrected"), and with allegedly fatal objections to it, to any similar theory, and to any theory of impossible objects. It

[1] We shall encounter many other examples of how the reorientation of Meinong's theory of objects pays off. We shall see, for instance, how the shift will enable the avoidance of the difficulties of Meinong's doctrines of the modal moment and some of the problems that are supposed to arise with regard to Meinong's notion of indifference of being (cf. Lambert's discussion, Lambert 1973, pp. 224–5).

would not be difficult to make a busy academic career from replying to objections to the theory of objects.

The first moves in discrediting noneist (or Meinongian) theories are commonly superficially harmless-looking, but in fact quite insidious, terminological shifts. In particular Meinong's objects are called *entities*, thereby writing in the assumption that they all exist in some way (since "entity" now means according to OED, "thing that has real existence", a sense also strongly suggested by the derivation of the term), and preparing the ground for the classification of Meinong's theory as an extreme form of platonism. Because Meinong's theory is so commonly misconstrued as a platonistic or subsistence theory it needs emphasising once more that the widespread practice of calling Meinong's objects "entities" is extremely misleading, and that of insisting that the objects all exist or at least subsist or have being, is mistaken; for Meinong explicitly denies that all his objects subsist or "have being".[1] Often, in the attempt to avoid misconstrual we shall use the neutral expression "item" which parallels Meinong's use of "object". "Item" is introduced as an ontologically neutral term: *it is intended to carry no ontological, existential, or referential* commitment whatsoever. In particular then, talk of items carries no commitment to, and should be sharply distinguished from, the *subsistence* of items; for "subsists" means, in the relevant senses, "exists, in some weak or low grade way". Impossibilia not only do not exist or subsist; they are not possible.

A theory of items – which is what noneism aims at – is a very general theory of all items whatsoever, of those that are intensional and those that are not, of those that exist and those that do not, of those that are possible and those that are not, of those that are paradoxical or defective and those that are not, of those that are significant or absurd and those that are not; it is a theory of the logic and properties and kinds of properties of all these items. Items are of many sorts: a preliminary classification is worthwhile, even if it turns on such treacherous notions, to be looked at only much later, as individual and universal. Some items are individual, and some are not but are

[1] This is clear from many points in Meinong's works. See, e.g., Findlay 1963, pp. xi and 45–7 and references there cited. Cf. also Chisholm 1967, p. 261:

> This doctrine of *Aussersein* – of the independence of *Sosein* from *Sein* – is sometimes misinterpreted by saying that it involves recourse to a third type of being in addition to existence and subsistence. Meinong's point, however, is that such objects as the round square have no type of being at all; they are "homeless objects", to be found not even in Plato's heaven.

universal. Individual items are particular, whereas universals, which are abstract items, relate to classes of particular items. None of these familiar distinctions will bear too much weight. Future individuals and nonexistent individuals are often not fully specific and have much in common with certain universals, especially individual universals (as they might well be called) such as the Bicycle, the Horse, the Aeroplane, the Triangle and so on. Individual universals however have much in common with nonexistent individuals, thereby smudging the distinction in the other direction.

(Consider, e.g. the differences between Meinong's round square, an individual, and the Round Square, the individual universal). Other preliminary classifications of objects run into similar or worse problems. Consider, for instance, Meinong's classification of objects into those of lower and higher order, a classification with much in common with the distinction between first and higher orders in modern logic. The modern logical account offers no serious characterisation of individual, and any object whatever can be included (as we shall see) in a domain of "individuals": a first-order theory can apply to objects of any order at all, and its only major drawback from this point of view is that it fails to give as full an account as it might of the logical behaviour of objects of higher order, e.g. of the linkage of properties (which are individuals, in the wide sense of singular quantifiable items) and predicates, of propositions and the sentences that yield them, and so on. Meinong's distinction of objects into lower and higher order may, at first sight, seem rather more promising: a higher order object is one which *involves*, or is *about*, an object. A proposition is thus a higher order object, because propositions are always about objects; but Meinong is a lower order object because, presumably, not involving any other object. But the distinction is not properly invariant under change of terminological characterisation, and repairing it would appear to lead to an obnoxious form of atomism. Thus neither The Triangle nor Triangularity involve, in any direct way, other objects, though both connect (in way that more than 2000 years of philosophy has sought to explicate) with individual objects. And Meinong, since identical with the author of *Über Annahmen*, does involve another object, namely, at least under the contingent identification, *Über Annahmen*. It might be argued, in the style of Wittgenstein's *Tractatus* and many earlier works, that there must be particulars, for such are fundamental as starting points; and out of these building blocks higher order objects are constructed. Appealing as this sort of picture may be, its charm begins to fade when the character (or, more accurately, characterlessness) of the particulars emerging is

discerned. And the fact is that unless a narrow preferred notation is insisted upon there will commonly be a circle of dependence. Nor can recent accounts, given in the literature, simply be taken over. The fact that many particulars do not exist, do not have good spatio-temporal locations, and so on, means that a good many of the proposed accounts of particulars, e.g. those of Strawson 1959, make assumptions which the theory of items rejects.

There remains a distinction, yet to be made out satisfactorily then, between particulars and non-particulars, the latter including all abstractions such as universals of one kind or another, attributes, classes, propositions, objectives, states of affairs, etc. In terms of this conventional distinction, which will be adopted for the time being, individuals and lower order objects are particulars, the rest are higher order objects.

None but particulars exist, and by no means all of these do. Particulars, i.e. particular items, accordingly divide into *entities*, those which exist at some time, and *non-entities*, those which do not exist at any time, and non-entities divide into *possibilia*, those which are logically possible, and *impossibilia*, those which are logically impossible. The rival terminology under which "possibilium" means "mere possibilium or entity" is not adopted. Sometime entities divide into those which are currently actual, real or actual entities or things, and those, like Socrates and the most polluted ocean in the twenty first century, which are merely temporally possible and do not now exist.

Making these distinctions out – for example, what distinguishes entities logically from possibilia? Are possibilia those items that can consistently exist and, if not, why not, and how do these things differ? – and discerning the distinctive logical principles, if any, for these distinct classes of items – for instance which logical principles hold for impossibilia, and in particular does the law of non-contradiction hold in any form? – furnishes much further material for the theory of items to operate upon.

It *may* be granted that these sorts of distinctions can be made, and the rather scholastic problems so far outlined investigated. But why do so? Why try to rehabilitate Meinong's theory of objects?

§1. The point of the enterprise and the philosophical value of a theory of objects.[1]

Though the reasons for trying to further the theory of objects are many and varied, there are some overarching reasons. There is simply no adequate theory of items that do not exist, or of non-actual items. Since so much of philosophy and of abstract and theoretical disciplines are concerned with such, devising an adequate theory is of the utmost philosophical importance. And only along the lines of a theory of objects can an adequate theory be reached. Likewise there is no satisfactory theory of intensional phenomena and intensional items. A theory along the lines of a theory of objects can provide a satisfactory theory of these things, but no theory falling short of such a comprehensive treatment of objects can do so. Consequently only through such a theory can an adequate theory of discourse and logic of discourse be obtained; for such a theory must account for the matters earlier cited, abstract objects and intensional phenomena. Apart from these large topics, there are connected or lesser things that a theory of objects is good for. We begin by spelling out some of these things, both large and small, in a little more detail: making good the claims will however occupy all of what follows, and more.

First, and of major importance, the theory of items forges keys which properly used will open most doors and vaults in the fortress of intensionality, a fortress which has proved largely impregnable to empiricist and to classical logical assaults. Why is intensionality important? The overwhelming part of everyday, and also of extraordinary, of scientific and of technical, discourse is intensional. Even superficial surveys of the published and spoken word will confirm this claim: work through a few columns of a newspaper or magazine or a literary or scientific journal, or even through a paper or two of our extensional friends, and see for yourself. If such philosophically important matters as truth and meaning are to be illuminated, claims made using such intensional discourse will have to be accounted for: a theory of intensionality will have to be devised. The need for such a theory becomes especially evident from the important programs of analysing

[1] Dene Barnett insisted, back in the mid-sixties, that a section should be written making as clear as possible the point, and fruitfulness, of a theory of objects. The importance and fruitfulness of the enterprise was, of course, long ago explained and illustrated by Meinong and his disciples Ameseder and Mally: see especially essays in *Untersuchungen zur Gegenstandstheorie und Psychologie*, ed. by A. Meinong, Leipzig (1904). A translation of Meinong's essay from this volume appears under the title "The theory of objects" in *Realism and the Background of Phenomenology*, edited by R. M. Chisholm, Illinois (1960), pp. 76–117. Even so many of the main, and now important, points remain rather inaccessible or less than clear or simply undeveloped.

philosophically important discourse and working out a more comprehensive logic of discourse. But it is also vital for the less ambitious task of making some limited progress on philosophical problems or obtaining some limited philosophical illumination: for most philosophical problems are intensionally set and will have to be solved or dissolved in the same setting.

Only a small beginning is made in what follows in showing how the theory of items helps with all these things: most of the effort will go into developing the theory to a point where it can be applied to some of these things. Some of the more specific things the theory can accomplish fairly directly are, however, worth recording.

The theory of items affords a sound basis on which quantified intensional logics, and more generally intensional logics with variable-binding devices, can be erected. For *a* major obstacle to the erection of such theories, has been, or at least seemed to be, the problem of quantifying into intensional sentence frames, i.e. of binding from outside variables covered by intensional functors. The trouble for orthodox positions is that the (nonclassical) objects these variables certainly appear to range over sometimes do not exist and generally are not fully determinate: they are incomplete (as, e.g., an arbitrary communist, an average philosopher) and may even be inconsistent (as, e.g., a square circle) in their properties. Accordingly such nonclassical objects are not in general accessible to the quantifiers and variable-binding operators of orthodox logics, e.g. classical theories, these operators being restricted to a domain of objects which exist, which are consistent and complete in all extensional respects, and which are determinate as to number and identity. Such nonclassical objects the theory of items, however, easily includes in its domain of items. Thus the theory provides an agreeably elementary solution to the problem of binding variables within intensional sentence contexts. The solution, which will be set out in more detail in what follows, has two main parts, designed to cope with two sets of difficulties: existence puzzles and identity puzzles. The existence puzzles are rather automatically solved simply by the admission as (object) values of variables of items which do not exist. Solving the identity puzzles is a matter of including in the theory of items an appropriate identity theory (such a theory is outlined in part IV).

The limitation of classical quantificational apparatus is just one reason why very many everyday sentences and many sentences figuring in philosophical argumentation which contain intensional expressions, are not amenable to formalisation at all, or else

are not satisfactorily symbolisable, within classical logics or classical theories. Consider such examples as: A ghost is a disembodied spirit; the building resembles the sea-monster Godzilla; or

(α) Ponce de Leon was looking for something, for the fountain of youth;

(β) The chief of the FBI is looking for a Communist;

(γ) Some people don't believe in any of Meinong's nonexistent objects;

(δ) An actual person sometimes wants something that doesn't exist;

(ε) My favourite fictional character is thinking about something which can't exist; namely a round square;

(ζ) Tom Jones knows not just that some thing doesn't exist, but of some thing that doesn't exist;

(η) Some mathematicians mistakenly believe that every consistent item exists.

(μ) A cyclone, code-named Thales, is expected to form over the Coral Sea tomorrow.

The fact that such sentences, and indeed very many other sentences, from metaphysics, from epistemology, and from ethics, for example, cannot be adequately formalised in classical logic has the serious consequence that classical logic cannot be used to assess the validity of many philosophical arguments in central areas of concern such as metaphysics, ethics, and epistemology. Such sentences can however be satisfactorily symbolised using neutral quantifiers and descriptors (not restricted by existence and identity fiats) and coupling expressions which do not carry existential loading; and such expressions and quantifiers the logic of a full theory of items would supply. Many statements and theses of major philosophical interest can then be formally represented, their consequences investigated logically, and the theses to this extent assessed. If just for this reason a theory of items demands philosophical attention.

Among philosophical positions beyond the scope of classical formalisation and classical logical assessment are the noneist positions of Reid, Meinong, and the Epicureans which introduced this essay. But there are many other positions besides noneist ones which elude classical formalisation and assessment, for example those of the dialecticians and of the nihilists (as DCL and NNL explain), not to mention the arguments of the sophists and much of traditional logic: indeed it is perhaps not going too far to suggest

that most important philosophical theories, not excluding those of modern exponents of and apologists for classical logic, lie beyond the scope of classical formalisation and assessment.

A theory of items even has its advantages as a basis for recent revolutionary, but atheist-like and bizarre, religious positions which consider God as a nonentity; for them God can, at any rate logically, be considered as a distinguished and worship-worthy nonentity among other nonentities. Seriously, however, an ontologically neutral logic, unlike classical logics, offers a basis on which various religious positions – which do make quantificational claims concerning God or gods – can be reformulated and formally assessed by an atheist.

The theory of items is good not merely for the formalisation and technical assessment of philosophical theses and positions, it is also of great value in resolving a variety of traditional philosophical puzzles concerned with intensionality and, what intensionality so often involves, non-existence. It copes directly, for example, with the ancient riddle of non-being, of how one can say of what does not exist that it does not exist, and, unlike Russell's theory which deals only with particular cases, it allows quantificational claims to be made, e.g. because Pegasus does not exist [$\sim E(g)$] some items do not exist [$(Px)\sim E(x)$], and so on. Less directly, the theory of items can cope with such traditional puzzles as that of fatalism, of the third man, and as to how things can come to exist and pass away, i.e. with puzzles of time and change.

More generally, wherever features of intensionality are philosophically important, the theory of items can make a major contribution: one example developed in detail subsequently is the case of perception, but there are many other examples, which the case of consent will illustrate. Consent is intensional both in that one may consent to what never does exist (or indeed cannot exist) and in its opacity; for one can consent to ϕing with x but not consent to ϕing with y though y is in fact identical with x. A direct account of the logic of consent, and a straightforward analysis of consent, are matters which the theory of items can handle but which rival theories cannot.

Philosophical difficulties concerning the interpretation of quantifiers in chronological logic closely resemble those in intensional logic and can likewise be resolved in a theory of items. Quantificational tense logics which eschew versions of the false sempiternal hypothesis, according to which if a thing exists at some time it exists at all times [symbol-

ised $((Ux)\,.\ (Pt)E(x;t) \supset (Ut)E(x;t))$], and in which the equally faulty tensed Barcan formula [symbolised $(\exists t)(\exists x)f(x;t) \supset (\exists x)(\exists t)f(x;t)$] is rejected, can readily be constructed using ontologically neutral expressions and quantifiers (on the principles rejected, and their appeal, see Prior 1957). In fact it is almost sufficient to transform n-place predicates, such as "$f(x_1, \ldots, x_n)$", into $(n+1)$-place predicates, such as "$f(x_1, \ldots, x_n; t)$", and to extend neutral quantification logic to include time variables, $t, t_1 \ldots$, as well as object variables. A more elaborate Newtonian tense logic can however be reached by adding the predicate constant "$\leqslant$", read "precedes or is simultaneous with", and appropriate time-ordering postulates on it (see chapter 2 [reprinted in Volume 2 *—Eds.*]); then by varying the conditions imposed on $\leqslant$ the usual tense logics can be recovered. For all these reasons the theory of items offers a suitable, and worthwhile, foundation for quantified chronological logics.

The theory of items plays a more fundamental role in semantics than has so far been revealed in indicating how the theory reinterprets quantified classical logic and chronological logic to advantage. Normal semantics for intensional logics require quantification over situations or worlds beyond the actual, possible worlds, and for richer systems, incomplete worlds and impossible worlds as well. It is evident enough that such worlds are just further sorts of non-existent objects, and indeed they function exactly like objects in the more formal semantical theory. The worlds have however caused severe metaphysical difficulties for standard logical positions, irrationally committed to the thesis that whatever is talked about, at least quantificationally, somehow exists. The result has been a situation like that regarding universals: the rejection of the semantics as not making sense, or some such, by the nominalistically-inclined, and attempted vindications of the semantics along conceptualist and realist lines, the latter sometimes taking such extravagant forms as a revival, in effect, of Democritus's theory of alternative existing universes. But, as in the case of universals, each of the three (classes of) positions rests on a mistaken assumption, which the theory of items avoids. Since the theory allows quantification talk of what does not exist, such as the worlds of semantics, it can furthermore erect on the basis of such semantical analyses ontologically neutral theories of truth and of meaning, which contain however no commitment to the existence of universals such as meanings (for details of such a construction see MTD).

The theory of items provides an alternative position on universals to any of the standard positions and, dare we claim it, a far more satisfactory position. In particular, it

provides a way of avoiding platonism and its existential commitments without abandoning talk of abstract items such as attributes and numbers. Platonisms are committed to the existence, or at least to the subsistence, of universals: noneism is not. Routes to platonism are cut by abandoning key premisses employed in reaching platonism, for example

(pi) Only that which is real or actual can have properties (a version of the Ontological Assumption), and

(pii) The Non-existent, and non-existent items, cannot be sensibly spoken about or discussed.[1]

On the contrary, according to noneist principles, nonentities such as universals can have definite properties; and *discourse about universals can continue without commitment thereby to the existence of universals*. This dissolves, in a shockingly elementary way, the main difficulty in the traditional problem of universals (but really it was a cluster of problems). Noneism has other important consequences (some of which, such as the way in which noneism enables a synthesis of standard positions on universals, will be drawn out subsequently). For one thing, given a formal theory of items various criteria for the existence of such items as universals can be symbolised, compared, assessed and, should they allow that any universals do exist, found wanting.[2] Consequently, too, a theory of items is especially important for the development of nominalisms which, like the *nnominalism* or *noneist nominalism* to be outlined, are not tied to the thesis: everything (in the universe of discourse) exists. For such nominalisms classical mathematics, including analysis and the theory of transfinite classes, is, after rephrasing, nominalistically admissible, provided that the quantifiers used in the rephrased formalisation do not carry existential commitment.[3] In contrast, classical mathematics as usually presented, with its staggering array of logically established *existence* theorems, is riddled with platonism, and is (n)nominalistically quite inadmissible.

As a further consequence, a logicist theory of mathematics can be developed without a heavy platonistic bias. For, contrary to popular preconceptions, logicism can be combined with nnominalism. By *logicism* is meant, as usual, the theory centered on the theses:

[1] Cf. Parmenides' self-refuting claim "it is neither expressible nor thinkable that What-Is-Not Is" in Freeman 1947, p. 43, and much subsequent literature from Plato's dialogues on – until Russell 1905.

[2] For a beginning on the assessment of criteria for the existence of properties, see NE.

[3] The quantifiers concerned are studied in SE, NE and Slog.

(li) For some logical system S the substance of classical mathematics is reducible to S;

(lii) The statements of pure mathematics are analytic.

A logicist reduction of mathematics to an existence-free logic – thereby avoiding contingent existential statements – was supported by Russell himself in Russell 1919, (p. 203, footnote). By taking the substance of classical mathematics to consist of a consistent subtheory of the pre-1911 theory rephrased with neutral quantifiers, the reduction relation in (li) as one of necessary (or strict) identity (as elaborated in IV below), and the analyticity property of (lii) as logical necessity of S5 strength, many objections to logicism are swept away.

Furthermore certain axioms usually thought to raise problems for logicism prove dispensable or innocuous when logicism is coupled with the thesis that mathematics is part of the theory of items. For instance, the axiom of infinity is only needed in the weak form: for some consistent class c, c is infinite (e.g. noninductive). Not only is there not much doubt that such a result holds as a matter of logical necessity,[1] but further such a result is provable given a suitable logical basis.[2]

Several other problems in the philosophy of mathematics can be given attractive solutions once mathematics is recognised as a special discipline within the theory of items. How mathematical theories can treat of seventeen dimensional spaces, of ideal points and masses, and of transfinite cardinals is readily explained: these theories treat of *non*entities. Just as there is no problem of mathematical existence, so there is no problem of mathematical entities, as there are none. But mathematical items there are

[1] For some arguments for this point see the defence of S5 as a system of logical modalities in EI. For a refutation of idealist doubts about the consistency of infinity see Russell 1937. A more recent doubt comes from a confusion of (a) an infinite totality possibly exists, with (b) an infinite totality is consistent. For some items which are consistent cannot possibly exist: see NE. That infinite totalities are such items is suggested by a reading of Aristotle's *Physics* Book III, B. Whether or not this is so, doubts about (a) should not automatically transfer to doubts about (b).

[2] For example it is provable in a modified form of Quine's system *ML*; where existential quantifiers are replaced by possibility quantifiers in the way indicated in SE. Lines of proof were indicated by Russell 1937, Chapter XLIII, and still earlier by R. Dedekind, *Was sind und was sollen die Zahlen*, 6th edition, Braunschweig, 1930.

Still more exciting are the prospects for paraconsistent noneist logic, where not only axioms of infinity but also axioms of choice can be proved (see UL [reprinted in Volume 4 —*Eds.*]), and where it may well be that inaccessibility axioms can be proved.

without limit, and their features, their incompleteness, their variety, are of much concern to noneists.

Then too an explanation can be given of how various mathematical theories which treat of ideal items manage to apply, e.g. to apply to the real world. In many applied mathematical problems, nonentities, which considerably simplify, and so render mathematically tractable, the entities they approximate in relevant respects, are introduced. Then the mathematical theory which treats of nonentities or ideal items can be applied, essentially as a logical juice extractor,[1] to yield more information about the items, and applied mathematical results are finally obtained by transferring back from the nonentities to the relevantly analogous entities. In replacing a problem by an analogous one for suitable simple nonentities, infinitely complex entities are typically replaced by finitely-specifiable regular nonentities, which are mathematically tractable and manipulable. Items of applied mathematical models are nonentities, which have just the desired properties (e.g. mass, position, velocity, size, elasticity) and no more (e.g. no determinate colour, origin, history). The loop taken through simplifying nonentities also helps to explain the point of many of the approximations made in applied mathematical problems. All this puts us on the road too, to explaining what is sometimes thought to be puzzling, how nonentities can have an explanatory role. They have such an explanatory role not only as ideal objects in applied models, but in all the ways that theoretical abstractions can serve in the explanation of what actually happens. Such explanations are possible because explanation is an intensional relation which can relate what exists to what does not.

II. Basic theses and their prima facie defence

Attempts to write offdiscourse concerning what does not exist as somehow improper, or second grade, or even as nonsense or ill-formed, continue to have currency, and will continue to appeal as long as rude empiricism persists as an important philosophical option. For simple subject-predicate statements about what does not exist run afoul of what fuels empiricism, the verification principle (in its multiplicity of forms). What does not exist cannot be produced for empirical verification of its properties. Accordingly

[1] The account is very different from instrumentalism, which certainly does not aim to explain the behaviour of what exists in terms of what does not, in terms of the physically ideal objects that make up the logical juice extractor.

such "statements" have whatever defects the verification principle ascribes to unverifiable statements.

The first theses to be defended – according to which subject-predicate sentences ascribing properties to nonentities may be significant, and yield perfectly good, first-class statements – are designed to meet empiricist criticism which would destroy any theory of items before it gets offthe ground. This is only part of a larger battle between empiricism and what the theory of items is really part of, rationalism. If the theory of items is correct there are ways of coming to know truths concerning, in particular, what does not exist which are not based, even ultimately, on sense perception; and so empiricism is false.[1]

A main, commonsense and anti-empiricist, thesis of the theory of items, reminiscent of Wittgenstein 1953, is that *very many ordinary and extraordinary statements about what does not exist are* perfectly *in order as they are*, and not in need of reduction or eliminative analysis. Defence of such a thesis is bound to be somewhat piecemeal, showing that for each particular sort of way in which statements can be out of order, the statements concerned do not suffer from *that* sort of disorder. Unsubtle application of the verification principle would yield the result that such statements (i.e., in *this* sense, declarative sentences) are out of order because meaningless. The first of the preliminary theses, already presupposed in earlier discussion, oppose the charges of meaninglessness and truth-valuelessness.

§2. Significance and content theses.

(I) Very many sentences the subjects of which do not refer to entities e.g. "the round square does not exist", "Primecharlie (the first even prime greater than two) is prime", are significant. Furthermore the significance of sentences whose subjects are about (or purport to be about) singular items is independent of the existence, or possibility, of the items they are about. (*The significance thesis*).

Thus, for example, the significance of "a is heavy" does not depend on whether or not a exists but only on whether "a is a material item (is material)" is (unlimitedly) true.[2] Thus,

[1] Certainly in judgement form, but also, as further argument will reveal, in concept form. The way in which the theory of items serves to refute empiricism and to instate a new rationalism will be much elaborated in subsequent essays.

[2] As ST explains. Significance here is context-independent significance, as contrasted with nonabsurdity of Slog.

since Kingfrance is a material item, "Kingfrance is heavy" is significant irrespective of whether or not Kingfrance (i.e. the present king of France) exists. Likewise the sentences "Kingfrance does not exist", "James Bond believes that Kingfrance is a heavy man" and "James Bond set out to find Kingfrance" are significant. Equally "Kingfrance is prime" is non-significant whether or not Kingfrance exists; similarly "Rapseq is witty" where "Rapseq" names the least rapidly convergent sequence.

As arguments for thesis (I) are well-known, only a few arguments are set out in brief form. Significance is (in the first instance) a time-independent feature of (type) sentences; therefore if there was, is, or will be a time at which such sentences are significant the sentences are significant. For example, the sentence "Kingfrance is wise" is significant because in earlier times, e.g. in 1453, the sentence would be used to make a genuine statement. Significance is a context-independent feature of sentences, a sense feature, not a denotational feature; therefore the significance of a sentence does not depend on such contingent context-dependent matters as whether a subject does have an actual reference. Thus the significance of a sentence is independent of whether in a given context its subjects have actual references, and of whether or not it expresses a truth. Indeed some statements about singular individual items are true or false because the items do not or cannot exist. But for the statements to have a truth-value the sentences which express them must be significant. More generally, the significance of a sentence is a necessary condition for it to express a statement of any sort, consistent or inconsistent, true or false. Hence whether or not the subject of a sentence exists does not affect the significance of sentences in which the subject appears. Hence too it is invalid to argue from inconsistency to non-significance.

A somewhat more subtle empiricist approach attempts to remove assertions about what does not exist from the main and serious scene of logic and philosophical investigation, as not really statements, as not truth-valued assertions at all, as less than serious assertions (like that to a bachelor, "So you've stopped beating your wife") whose truth or falsity doesn't arise. The facts of discourse are quite different.

(II) Many different sorts of statements about non-existent items, including many of those yielded by single subject-predicate sentences, are truth-valued, i.e. have truth-values true or false.[1] Hence, in particular, many declarative sentences containing subjects which

[1] Or if need be, should bivalence fail, true and not-true.

are about nonentities yield statements in their contexts. More generally, many sentences about nonentities have content-values in their contexts. (*The content thesis*).

For example, such declarative sentences as "Rapseq does not exist", "Hume's golden mountain is golden", "K believes that the present king of France is of the House of Orleans" are statement-capable in many, and normal, contexts and have truth-values and other content-values. Thus, for instance, the sentence "Rapseq does not exist" yields in intended contexts a statement which is analytic, and so true.

About many such statements there is, and is room for, but little dispute. Among such statements are those expressed by sentences of the form af, where "a" is about a non-entity and "f" is an ontic predicate such as "exists", "does not exist", "is fictional", "is imaginary", "is impossible". It is not in much dispute, for instance, that "Meinong's round square is a possible object" is false and that "the present king of France does not exist" (or, more idiomatically, "there exists no present king of France") is true. A perfectly respectable mathematical argument may conclude: Therefore Rapseq does not exist. Nor is it really in dispute that logical truths are not upset by non-existence. Whether or not the king of France exists, the statement "The king of France is wise and the king of France is not wise" is false. Even if the statement "The king of France is wise" is not truth-valued, it manages to respect logical laws (this fact tells against simple many-valued approaches to the logics of truth-value gaps). Nor is it in dispute that many intensional statements (purportedly) about non-existent objects are truth-valued, e.g. "Ponce de Leon sought the fountain of youth", "Z thinks the fountain of youth is in Ruritania", and "K believes the present king of France is wise". The fact that thesis (II) is not in dispute concerning all these types of cases has a substantial bearing on cases where it is in dispute, e.g. as regards whether such statements as "The fountain of youth is in Ruritania" and "The present king of France is wise" are truth-valued. For, to put the point semantically, there are worlds or situations, such as those of Z's thoughts or K's beliefs, where the question of the truth-values of statements whose truth-values are said not to arise do arise.

The main disputed cases of the philosophical literature take the form af, where "a" is a description (such as "the present king of France") or a descriptive name (such as "Kingfrance") of a nonentity and "f" is an extensional (and usually empirical) predicate such as "is tall", "is bald" or "is wise". One of the main logical issues separating Russell (and others) from Strawson (and Geach and others) was as to the falsity or otherwise

of such statements as the "The king of France is wise", Strawson maintaining that the truth or falsity of such statements does not arise, that there are (as Quine was later to put it) in the case of such statements, truth-value gaps. Strawson's evidence for his claim was, it now appears in retrospect, remarkably flimsy. The case was allegedly based, predominantly, on ordinary usage, on what it was supposed you, ordinary language user,[1] would say when

> someone were in fact to say to you with a perfectly serious air: "The king of France is wise". Would you say "That's untrue"? I think it is quite certain you would not. But suppose he went on to *ask* you whether you thought that what he had just said was true, or was false; whether you agreed or disagreed with what he had just said. I think that you would be inclined, with some hesitation, to say that you did not do either; that the question of whether his statement was true or false simply *did not arise* because there was no such person as the king of France (OR, pp. 174–5).

That ordinary usage would deliver a clearcut verdict on values – hard data of the sort logical theories should acknowledge – in a context as unordinary as that of the example was hardly to be expected. And the fact is that many of us would not make the responses Strawson claims we would: Meinong would not, Russell would not, Carnap would not, and so on, for many others. But what of those uncorrupted by logical theory of one sort or another: perhaps most, or enough, of those would respond as Strawson suggests? Would they? Strawson's case was not, of course, supported by empirical or statistical surveys of what people actually do say. When evidence of *that* sort did come in, using the methods of Naess 1953, it tended to support Russell rather than Strawson; it told against truth-value gaps, and undercut Strawson's certainties about what one would say. Subsequently (in Strawson 1964, p. 104) Strawson substantially weakened his claim that ordinary usage supported the truth-value gap theory as opposed to the truth-valued theory:

> . . . ordinary usage does not deliver a clear verdict for one party or the other. Why should it? The interests which ordinary usage reflects are

[1] I think it is true to say that Russell's Theory of Descriptions . . . is still widely accepted among logicians as giving a correct account of the use of such expressions (as definite descriptions) in ordinary language. I want to show . . . that this theory, so regarded, is seriously mistaken (OR, p. 163).

> too complicated and various for it to provide overwhelming support for either way of *simplifying* the picture. ... Instead of trying to demonstrate that one is quite right and the other quite wrong, it is more instructive to see how both are reasonable, how both represent different ways of being impressed by the facts.

Thus Strawson in effect abandons his main argument (of OR) against the truth-valued theory. Nor (as we shall shortly see) is the data as kind to the gap theory as is supposed: there are many cases, even exhibiting radical reference failure, where values are assigned, where it is not so reasonable to try to apply the gap theory.

Much of the rest[1] of Strawson's case relies on an assumption, shortly (in the next section) to be completely rejected, the Ontological Assumption. A (simple) sentence whose uniquely referring subjects fail to designate anything actual is

> neither true nor false any more than it is *about* some object; ... it will be used to make a true or false assertion *only* if the person using it *is* talking about something. If when he utters it, he is not talking about anything, then his use is not a genuine one, but a spurious or pseudo-use ... (OR, p. 173).

Strawson offers no argument for this positivistic writing-offof commonly occurring countercases to his claim, as spurious or pseudo-uses,[2] or for the major assumption on which all this relies, the Ontological Assumption, that such a statement has a truth-value, and is about something, only if the subject does refer to an existent object – no argument, though the assumption is reiterated through his discussion in OR, (see pp. 167, 173, 175, 176 (twice), 177 (several times), 188).

[1] Strawson, like others, also depends in his argument upon confusing failing to designate with designating a nonentity, and attributing curious features of the former to the latter. Strawson's restriction of quantifiers to existentially loaded ones, so that *nothing* amounts to *nothing existent* and *anything* to *anything existent*, of course encourages such confusion.

[2] In revised reprints of OR it is suggested, in some places at any rate, that talk of spurious uses be replaced by talk of secondary uses – as contrasted with talk of primary uses, which are alleged to conform to Strawson's theory. The move represents a typical piece of theory-saving: compare the Quinean strategy of dismissing the wealth of important discourse the canonical language cannot accommodate as second-grade discourse (or worse). The rich variety of counterexamples to the Ontological Assumption, including very many *Sosein* statements, are secondary in Strawson's sense.

Quite apart from the latent positivism, Strawson's methodology in OR leaves a lot to be desired. For example, the "source of Russell's mistake" (p. 172) is investigated before any solid evidence is adduced that a mistake has been made or that Russell made it. Much of the early part of OR is a guilt by allegation job.

There are good, though not decisive, reasons for saying what many of us would say, and in support of (II). *Statements about what does not exist behave in an entirely propositional fashion.*[1] They can, firstly, be the object of propositional attitudes; what they convey can be believed and thought about and reasoned about. Secondly, they serve an important communicational role; they convey information, they have a content which can be variously expressed in different languages. Thirdly, they have a full inferential role: they figure in assumptions, implications, arguments, and entailment relations; they can be asserted and refuted; and so on.[2] But if they behave propositionally then they have propositional features, such as being truth-valued. For the propositional content expressed either holds in the actual situation or it does not, i.e. it is true or it is false. The argument given sneaks in, however, two-valued assumptions about the logic of propositions, assumptions which can be rejected. It may be said that, though the matter *is* propositional, the logic of propositions is not two-valued (but is, e.g. many-valued, supervaluational, etc.). Certainly logics of propositions which are not two-valued may be devised: logics of entailment, to be adopted subsequently, deliver such logics (and also show how such logics may be built from two-valued components, and a two-valued logic thus reintroduced as basic). The issue becomes, like so many philosophical issues, rather more a matter of which logic to choose to account for which data. The claim here – though not *too* much hangs on it, since the theory to be elaborated could be reworked on a three-valued basis with values: true (10), false (01) and neither (00); or, better, on a symmetrical four-valued basis with further value: both (11) – is that a two-valued propositional basis is much preferable to account for the data, not for reasons of simplicity and the like (though these are factors), but for the following reasons:

Firstly, many statements of the type written offby truthvalueless accounts as not truth-valued are commonly assigned a truth-value. As Lambert remarks (Lambert 1972, p. 42):

> ... it is counterintuitive to treat identities such as "The teacher at Sleepy Hollow is Richard Nixon" as truthvalueless: it is plainly false.

[1] It is immaterial for the purpose of these arguments exactly which theory of propositions or contents is adopted: propositions could even be treated as certain ordered couples consisting of sentences, or equivalence classes of sentences, coupled with the relevant context.

[2] These reasons also support the significance thesis (I). For an elaboration of these sorts of points, and others, against Strawson's position see Nerlich 1965.

Similarly statements such as "Richard Nixon is the present king of France", "The king of France is not human", "Phlogiston is a heat substance", "Pegasus is not a horse", "Sherlock Holmes is a detective" and "The man who can beat Tal doesn't exist" are truth-valued. And as van Fraassen remarks (van Fraassen 1966, p. 490, also citing sources for the examples he gives),

> ... there certainly are sentences in which there occur nonreferring singular terms and to which we do assign a truth-value. Examples are: The ancient Greeks worshipped Zeus. Pegasus is to be conceived of as a horse. The wind prevented the greatest air disaster in history.[1]

At the very least then, truth-value gap theories are obliged to offer criteria distinguishing truth-valued and truthvalueless cases, criteria markedly different from those, such as containing a nonreferring subject, that have hitherto been suggested. But in fact logic should not have to wait, to get started, upon such criteria: if a uniform logic, without initial gaps, which reflects ordinary responses (as assessed, e.g. by questionnaires like Naess's) and which is otherwise unproblematic, can be devised, so much the better.

Suppose however criteria are furnished (and thus one of the intermediate interpretations of van Fraassen 1966, p. 490 results): would we want to say that such assertions as "The king of France is bald" – an alleged paradigm of truth-valueless assertions – are not truth-valued? Many of us would not.[2] Consider the sort of assumptions that go into the claim that it is not truth-valued. It is assumed that the assertion is not about anything – anything actual, it should be said: for plainly enough it is about the king of France.[3] The semantical argument from reference failure to truth-value gaps is however based on the mistaken assumption, that such offending subjects as "the king of France" are not about anything. Strawson, for example, states his newer case (Strawson 1964, p. 116) for truth-value gaps as follows:

[1] At least the first two examples are however clearly intensional, and fall within the scope of earlier remarks. Such examples also create serious difficulties for Russellian-style theories.

[2] That some would is immaterial. There is substantial empirical evidence that not all of us adhere to the same logical principles and that semantical theories, where articulated, are even more diverse.

[3] It is evident that Strawson makes such an assumption, that in cases of reference failure the subject cannot be *about* anything. Thus, firstly,

> If we know of the reference failure, we know that the statement cannot really have the topic it is intended to have and hence cannot be assessed as putative information about that topic. It can be seen neither as correct, nor as incorrect, information *about its topic* (Strawson 1964, p. 116).

> The statement or predication as a whole is true just in the case in which the predicate-term does in fact apply to (is in fact "true of") the object which the subject-term (identifyingly) refers to. The statement or predication as a whole is false just in the case where the negation of the predicate-term applies to that object, i.e. the case where the predicate-term can be truthfully denied of that object. The case of radical reference failure on the part of the subject-term is of neither of these two kinds. It is the case of the truth-value gap.

Read as intended the account is inadequate; for it fails to give an intermediate position, but assigns such sentences as "Pegasus is not a horse" as gap cases. Such a gap view is also implicit (as Strawson remarks) in Quine's succinct (but unduly narrow, since plural subjects are excluded) account of predication (WO, p. 96):

> Predication joins a general term and a singular term to form a sentence that is true or false according as the general term is true or false of the object, if any, to which the singular term refers.

Now if the subject term is about an object which does not exist, *no* truth-value *gaps* remain. It will of course be objected that reference failure occurs just where the object (so to speak) does not exist, so no object is *referred* to. But the point wanted thereby emerges clearly enough, namely that *the gap theory depends on the assumption that all objects exist*. Given thesis M1, the semantical case for gap theories is voided. It will be protested also that in the absence of the king of France the usual empirical tests for baldness cannot be applied (cf. Lambert and van Fraassen 1972, p. 219 in their effort to "try to take seriously the idea that in many cases statements about non-existents are really very puzzling"). But empirical tests are far from the only ones we commonly use in determining truth-values. Consider the king of France, and his features. Since nothing in the characterisation of the king implies, or inclines us to think (unless we make a mistaken identification), that he is bald, there is no basis for assigning truth-value true to the assertion.[1] That is, it is not true that the king of France in bald: about this

[1] The context is taken to be one – familiar enough to philosophers but often said by philosophers to be queer – of philosophical investigations; so that no further features accrue to the king of France than those his characterisation supplies. Even so (pace Crittenden 1970–71, p. 91) the statement "The king of France is bald" is not about nothing whatsoever, but about, what it seems to be about, the king of France. In a different context, e.g. that supplied by Steinbeck's novel *Pippen IV* which is about a contemporary king of France, truth-value assessment of such assertions as that the king is bald turns on further consideration, such as what features the story ascribes to the king.

there is comparatively little disagreement. Hence, by bivalence, it is false that the king of France is bald. But bivalence is what is at issue. It is an issue that can, in large measure, be avoided by operating with values *true* and *not-true*, and leaving the connections with value *false* open (though reasons are given in Slog and RLR for closing the issue so as to ensure bivalence of significant assertions). For what matters, the logical behaviour of statements about nonentities, and the failure of the assumption that a statement about an item is not true unless the item exists, can be investigated rather independently of the falsehood issue. Nonetheless it does appear that the king of France, even if a very incomplete object, generates no gaps.[1] A first argument appeals, in effect, to Quine's account of predication which builds in bivalence: that the king of France is bald is true or false according as the predicate "is bald" is true or false of the object, the king of France, i.e. according as the king of France is among the bald objects or not; but it must be in the class or not. A second argument runs from nontruth to falsehood. If it is not true that the king of France is bald, then it is not the case that the king has the property of baldness; so the king does not have the property of baldness; and so the king is not bald, that is (by a Tarski biconditional) it is true that the king is not bald, and hence it is false that the king is bald. The argument may, hardly necessary to say, be broken at several points, but at none very plausibly. Generalising the argument to assertions of the form af, there are no gaps.

Secondly, the leading features of truth-value gap accounts can be obtained by a *cross-classification* of statements in theories which avoid truth-value gaps. For example, the incompleteness and indeterminacy features of "Kingfrance is bald" – the features which, in a bumbling way, theories of truth-value gaps are really endeavouring to capture – emerge, as on Russell's theory, from the falsity of *both* "Kingfrance is bald" and "Kingfrance is not bald", these taken together revealing a gap in Kingfrance's properties. More generally, in a relevance logic framework, both truth-value gaps (incompleteness) and truth-value gluts (overcompleteness or overdetermination) can be defined in terms of truth-valued expressions: thus at each world a, A is incomplete at a, symbolised $IC(A, a) = 1$, i ff$I(A, a) \neq 1 = I(A, a^{\dagger})$ i.e. iff A does not hold at a but holds at its image

[1] The situation with the images of the paradox statements (e.g. "This statement is true", "The class of all self-membered classes is self-membered") may appear rather more testing for the theories without gaps. In fact it is not.

$a^{\dagger}$ [i.e. iff A does not hold at a and nor does $\sim A$ hold at a *—Eds.*] (see RLR, chapter 7).[1] In short, the advantages and philosophical point of a gap theory can be obtained without truth-value gaps: the gap theory is unnecessary as well as being an inferior way of handling the data, features of incompleteness. Moreover the disadvantages of gap theories are thereby avoided, e.g. the problem of assessing truth-valued compounds with components which lack a truth-value, e.g. ΦA where ΦA is truth-valued though A is not.

The serious gaps in the logics of gaps – e.g. the trouble with supervaluation methods that one cannot express in the logic that a statement has a gap-assignment, i.e. that its truth-value is not assigned or does not arise – will be brought out subsequently in discussing the logic of nonentities and free logics: so too will the perplexing asymmetry of the gap theories, that gaps should be allowed for but not gluts. For the moment it is enough to observe that if a satisfactory logic of gaps were produced, it could be superseded (by the methods of universal semantics, of ER) by a logic which translated its claim accurately and which also accorded with thesis (II).

The really important point is, however, not that alternatives, such as those of Strawson and successors,[2] to classical theories of descriptions violate thesis (II): if necessary noneism could be reexplained without reliance on thesis (II) in a logical frame allowing gaps and gluts (see RLR). The important point is that noneism rejects the assumptions on which both the orthodox rivals, Russellian and Strawsonian accounts and their variants, are based: for the truth of af neither implies nor presupposes[3] that a exists. To assume it did would be to accept the Ontological Assumption, the rejection of which is a main thesis of noneism (part of M3). Insofar as the choice as to theories of descriptions has been presented as a choice between logical theories, such as Russell's, and non-formal theories, such as Strawson's, the choice is a false one based on a nonexhaustive dichotomy. There are other theories which reject the mistaken assump-

[1] The supervaluational methods of van Fraassen, and of Routley NE, pp. 279–80, discussed later also operate by assigning *as if* truth-values to all gaps in initial valuations; the gaps reappear in the overall valuations.

[2] Some of the successors will be considered briefly in part III [see, especially, §14 *—Eds.*]: but since they all incorporate the Ontological Assumption they are of pretty limited interest.

[3] "Presuppose" is introduced in ILT to take up the "special or odd sense of imply" of OR, p. 175:

> To say "The king of France is wise" is, in some sense of "imply", to *imply* that there is a king of France.

A presupposes B iffthe truth or falsity of A does not arise unless B is true, i.e. A is either true or false only if B is true (see ILT, p. 175). Hence since af presupposes aE, according to the gap theory, af is not true unless a exists.

tion, the Ontological Assumption, on which both Russellian and Strawsonian accounts are premissed. Thus the celebrated dispute between Russell and Strawson – a dispute centered around the correct formulation of the Ontological Assumption in the case of descriptions, over the relation of the truth-value of af (with a a descriptive phrase) to the existence of a, as to whether one who asserts af asserts or logically implies aE or whether the truth-valuedness of af only presupposes aE – is a relatively minor one.[1] From the point of view of examining and questioning fundamental assumptions it is like taking the central issue of Christian religious conviction as being that of whether one should choose to be a catholic or a protestant, leaving unquestioned the fundamental assumptions of Christianity and ignoring the major issue as to whether one should be a believer at all.

§3. The Independence Thesis and rejection of the Ontological Assumption.

Theses (I) and (II), though allowing that many sentences about nonentities make sense and are truth-valued, give no information about the truth-value that they have, and are compatible with their *all* being false.[2] There is a very widespread assumption, implicit in most modern philosophical theories, which settles the truth-values of very many of these statements, namely the Ontological Assumption (abbreviated as OA), according to which no (genuine) statements about what does not exist are true. Alternatively, in a more careful formal mode formulation, the OA is the thesis that a non-denoting expression cannot be the proper subject of a true statement (where the proper subject

[1] For instance, Strawson accepts leading (and, as we shall see, contentious) features of Russell's analysis considered merely, as Kleene 1952 and others consider it, as providing truth conditions for a descriptive statement (OR, p. 167 and p. 174). Given that the theory of descriptions is presented, as many logic texts present it, as a biconditional eliminating descriptive phrases in favour of quantified ones – *not* as saying that to *assert* the claim involving the description is to *assert* the claim with the description eliminated (not something Russell usually claimed in any case, so that much of Strawson's attack, against the second thesis (2) of OR, p. 174 is misdirected) – Strawson's main objections reduce simply to this objection (which has already been dealt with): that it is false that anyone uttering a sentence, such as "The king of France is wise" with a non-referring subject, would be making a true or false assertion (i.e. to the rejection of second thesis (1), OR, p. 174).

The commonality of the Russellian and Strawsonian accounts also emerges strikingly in Strawson 1964 in what Strawson takes as uncontroversial and not in dispute – which includes claims that noneists would certainly dispute.

[2] All positive statements, that is. Naturally their negations, which are said not (really) to be about nonentities, will be true.

contrasts with the apparent subject which is eliminated under analysis into logical or canonical form).

It is the rejection of the Ontological Assumption that makes a proper theory of items possible[1] and begins to mark such a genuinely nonexistential theory offfrom standard logical theories. According to the OA – to state the Assumption in a revealing way that exponents of the Assumption cannot (readily) avail themselves of – nonentities are featureless, only what exists can truly have properties. All standard logical theories are committed, usually through the theory of descriptions they incorporate, to some version of the Ontological Assumption. The assumption is found in an explicit form in the theory of descriptions of PM: according to theorem *14.21 all statements about items which do not exist are false; only about existent items can true statements be made. (Russell does allow a description which lacks a referent to *occur* secondarily in true statements, but such statements are not *about* the item, and do not yield "genuine" properties.) The theory of Hilbert–Bernays allows the introduction of descriptions only on the (rule) assumption that they have a referent i.e. that the items they describe exist; hence descriptions lacking reference cannot even be introduced, and we are precluded from making *any* statements, even false ones, about nonexistent items. Another favoured technique for excluding nonentities is the identification of all nonentities with some peculiar item which has few or no properties, such as "the null entity" (e.g. Carnap MN and Martin 1943), or the null class (e.g. Frege 1892, and Quine in ML). In the latter case a nonentity such as Pegasus would have no properties other than such properties of the null class as having no members.

The incorporation of the Ontological Assumption (the "common prejudice" Reid refers to) as a basic ingredient in all standard logical theories – and in all standard discussions of such philosophical problems as universals, the objects of perception, the nature of mathematical objects, etc. etc. – simply reflects its status as a virtually unques-

[1] Grossmann makes a similar point (Grossmann 1974, p. 50):

> Without the assumption that nonexistent objects have properties and stand in relations, it is safe to say, there could be no theory of objects – nor could there be, I might add, phenomenology.

But as regards his claim that the content-object distinction is a necessary precondition for the theory of objects –

> Without this distinction, I am convinced, there would be neither phenomenology nor a theory of objects (p. 48) –

Grossmann is entirely mistaken. A theory of objects could be based on a direct realist theory of perception (somewhat like Reid's) which avoids, or even repudiates, the content-object distinction.

tioned philosophical dogma. Philosophers of almost[1] all persuasions seem to agree that statements whose (proper) subject terms do not have an actual reference *somehow fail*. But though these philosophers agree that such statements fail they disagree on how to characterise this failure. According to the strongest affirmation of the featurelessness of nonentities, that of the early Wittgenstein and of Parmenides, such statements are not just meaningless, they can't even be made or uttered; according to Plato such statements are nonsense; according to Strawson they are not truth-valued; and Russell, as well as standard logic, tells us that they are all false. The lowest common denominator of these pervasive positions is given by the following formulation of the Ontological Assumption: *it is not true that nonentities ever have properties; it is not true that any nonentity has a genuine property.*

In stating the Ontological Assumption in this form we have transgressed the bounds of discourse permitted by some of the traditional positions discussed. Parmenides, for instance, might say that as an assertion about nonentities the Ontological Assumption itself cannot be uttered. But of course it can. In clarifying his claim he might go on to assert, with Plato, that the Ontological Assumption cannot be *significantly* asserted. However within weak but quite defensible significance logics (see Slog, chapter 5) the Ontological Assumption can be significantly formulated: "not true" can be symbolised using the significance connective "T", so defined that Tp has the same value as p when p takes value true or false and Tp has value false when p takes the value nonsignificant.

In contrast to the more restrictive significance formulations of Wittgenstein and Plato, the Ontological Assumption presented by Russell is not a significance thesis, but rather the thesis that what does not exist has no properties , that it is featureless. In formulating the Assumption in this general way, instead of exemplifying it for descriptions, we have also gone beyond the bounds of Russellian logic, and in fact used non-existential quantifiers.

Reexpressed as a meaning rule the Ontological Assumption requires that all (proper) subject terms of true statements must have actual reference. So expressed the Ontological Assumption again provides a lowest common denominator for a pervasive class of theories. For the disagreement of Parmenides, Plato, Russell and Strawson is not a disagreement over the correctness of this meaning rule – they all agree that all subject terms

[1] The tiny (disparate) group of free logicians and noneists constitutes the main exceptions.

in true sentences must have actual reference – but rather a disagreement over how the violation of such meaning rules affects truth-value status. Thus the Parmenidean position takes the rule as like principles of physics, as literally impossible to violate, whereas Plato and also Wittgenstein (in Wittgenstein 1947) see violations of the rule as leading to meaninglessness; according to Frege (on one account of his views) and Strawson, however, statements may violate the rule only if they are not truth-valued, while according to Russell and mainstream modern logic all statements breaking the rule are false. What all these positions have in common, and what is important here, is the acceptance of the meaning rule itself, embodied in the Ontological Assumption. In these disputes about how to classify violations of the rule, the question of the correctness of the rule itself is completely overlooked. So for anyone who wishes to reject the rule itself as mistaken, the traditional and modern disputes, e.g. that between Strawson and Russell, are comparatively unimportant; the *general* question of the value status of non-referring assertions is based on a false assumption – the Ontological Assumption.

The Ontological Assumption – and thereby all the positions alluded to – was explicitly repudiated by Meinong's and Mally's Independence Thesis, namely

(III) That an item has properties need not, and commonly does not, imply, or (pre)suppose,[1] that it exists or has being. Thus statements ascribing features to nonentities may be used, and are used, without involving *any* existential or ontological commitment. (*The basic independence thesis*)

The Independence Thesis (IT), as historically formulated,[2] has weaker and stronger forms, e.g. modal (possibility) forms as distinct from assertoric forms, and also conflates certain theses with the IT which it is important to separate, in particular

(i) the Advanced Independence Thesis (AIT), according to which nonentities (can and commonly do) have a more or less determinate nature[3] (thesis M3 of part I), and

[1] *(Pre)suppose* is intended to cover logical relations such as contextual implication and also weaker relations than implication. With (pre)supposition theory as it has been expounded – by Strawson and others and by many linguists there remain many logical troubles, e.g. it is never explained which predicates' presuppositions hold for, and which not, what the logical properties of (pre)supposition are, how like an implication relation it is or whether it is more like an inference rule, how exactly it ties with the traditional idea of existential import, and so on.

[2] See, for example, Meinong TO, p. 82.

[3] Having a *nature* requires (something more like) having a suitably rounded set of extensional properties. That the round square is thought of by someone, ascribes an intensional property to the round square, but contributes nothing toward assigning a nature of some sort to the round square.

(ii) the Characterisation Postulate (CP), according to which nonentities have their characterising properties (thesis M6 of part I).[1]

Even if the basic independence thesis holds, in virtue of nonentities having, for instance, significance and intensional features, this does not (as free logic models will show) guarantee the advanced thesis, AIT, or the characterisation postulate, CP.

Meinong's apparent vacillation in formulations of the Independence Thesis can be explained by seeing the principle as the denial of implications of the Ontological Assumption expressed in the following form:

The truth of xf, or that x has characteristic λf, implies (or presupposes) that x exists (cf. TO, p. 82, lines 2–4).

Meinong denies not just the strict implication, by asserting that nonentities can have features, but also the material implication, in asserting that nonentities *do* have properties.

The Ontological Assumption was not rejected by Meinong merely in the weak sense in which it is rejected in free logic where nonentities, though permitted to figure in true statements in a backdoor way through constants, are not values of subject variables, and so are not full logical subjects. What was implicit in the Independence Thesis for Meinong, and would follow given an appropriate account of property, was also the guarantee that nonentities could occur as genuine subjects in true statements and could occupy all subject roles; that is to say, nonentities are amenable to the normal range of logical operations such as quantification, description, instantiation and identification (e.g. for "Pegasus" to count as a full logical subject the inference from "Pegasus is winged" to "something is winged" must hold good, and the identity "Pegasus = Pegasus" must be true). Thus Meinong's *Full* Independence Thesis, that the ability to fill the full subject role in a true statement is unaffected by nonexistence, commits him in modern logical terms not merely to free logic but to a thoroughgoing non-existential logic. Thus too an essential corollary of Meinong's theory, for which he explicitly allowed, is the introduction of non-existential analogues of the usual existentially loaded operations, for example he allowed for and used the non-existential quantifiers, "something" or "for some object" and "everything", which carry no commitment to the existence (or transparency) of the items they quantify over, as well as the usual existentially or referentially loaded quantifiers of the kind famil-

[1] The confusion of these three theses persists in modern literature, e.g. Linsky 1977, p. 33.

iar from Russell's and Quine's theories. For wide or neutral quantifiers the characteristic thesis of free logic, that everything exists, fails since many objects do not exist.

It is important to distinguish the Independence Thesis, that the characterisability of an item is independent of its existence, from the stronger false thesis rejected by Meinong, that the non-existence of an item does not affect its nature, or that entities and nonentities may be exactly alike, e.g. to put it in extreme form, that one could have two items identical in all respects except the one existed and the other did not. The confusion of the Independence Thesis with this false doctrine has contributed to the view that Meinong took nonentities as subsisting. Nor does it follow from the Independence Thesis that there is no difference between the sorts of properties that entities and nonentities can have, or between the logical behaviour of entities and nonentities. What the Independence Thesis does claim is that *the having* of properties is not affected by existence, or alternatively, that the nonexistence of an item does not guarantee (and cannot be defined as) the failure to possess properties.[1] In view of it we can correctly attribute some properties to nonentities.

Meinong not only repudiates the assumptions – fundamental to standard theories of meaning and truth – that what does not exist or is not real has no properties, is featureless or cannot be truly or sensibly spoken about or discussed; he also rejects *consistency* forms of the assumptions such as that only what is possible can have properties or can be spoken about. All these assumptions are opposed by the central tenet of the independence principle, the thesis according to which *nonentities, including impossibilia, sometimes do have definite properties*, they are not featureless.

All the independence theses depend for their viability on the occurrence in discourse of expressions, in particular subject expressions, free from existential loading. According to the theory of objects – in contrast to classical logical thinking – there are *two types of discourse*, existentially loaded discourse, and discourse free from existential loading. Although in many occurrences subjects of statements *do* carry existential loading, that is, they imply or presuppose that the items designated exist, quite often

[1] The relation of independence used is the, quite familiar, non-symmetrical relation, e.g. x may be independent of y financially without y's being independent of x.

In the stronger symmetrical sense of independence – where A is *logically independent* of B if and only if A does not entail B or the negation of B, and B does not entail A – *Sosein* is *not* independent of *Sein*. For, in particular, certain sorts of characteristics, e.g. being squound (square and round), entail nonexistence.

subjects do *not* carry existential loading – as, for example, when they occur in true assertions of nonexistence, when they occur within the scope of certain intensional functors, and when they occur in usual mathematical contexts, pretence or fictional contexts, and philosophical contexts (as examples will soon enough make evident).

> According to Meinong, the two statements "The round square is round" and "The mountain I am thinking of is golden" are true statements about nonexistent objects; they are *Sosein* and not *Sein* statements. The distinction between the two types of statements is most clearly put by saying that a *Sein* statement (for example, "John is angry") is an affirmative statement that can be existentially generalised upon (we may infer "There exists an x such that x is angry") and a Sosein statement is an affirmative statement that cannot be existentially generalised upon; despite the truth of "The mountain I am thinking of is golden", we may not infer "There exists an x such that I am thinking about x and x is golden" (Chisholm 1967, p. 261).

According to classical logical theory, by contrast, all statements are made up from atomic *Sein* statements: the atomic statement $a\psi$ (e.g. "a is red"), or more generally $(a_1 \ldots a \ldots a_n)\psi$, *always* implies, or presupposes, that a exists. On the theory there are really no *Sosein* statements, and the OA is always satisfied at bottom (i.e. after logical analysis). It is for this reason that Chisholm maintains that Russell's theory of descriptions is no refutation of Meinong, but "merely presupposes that Meinong's doctrine is false".

> According to Russell, a statement of the form "The thing that is F is G" may be paraphrased as "There exists an x such that x is F and x is G, and it is false that there exists a y such that y is F and y is not identical with x". If Meinong's true *Sosein* statements, above, are rewritten in this form, the result will be two *false* statements; hence Meinong could say that Russell's theory does not provide an adequate paraphrase (Chisholm 1967, p. 261 continued).

In fact Russell's theory *does not* provide an adequate paraphrase (as we will see in part III).

Meinong did not bring it out as sharply as he might that one and the same (type) sentence can yield, in different contexts, either a *Sein* or a *Sosein* statement. Consider, for instance,

(α) Phlogiston is a substance which accounts for combustion and oxidisation.

In one context, e.g. one explaining the phlogiston theory, the statement (α) yields is true, indeed necessarily true since phlogiston may be characterised in part in just that way. In another context, however, e.g. that of explaining what actually does account for combustion, (α) is false. That is, as a *Sein* statement, an existentially loaded statement, which supposes existence of phlogiston, (α), which we may represent as

(α^{E}) Phlogiston^{E} is a substance which accounts for combustion and oxidisation,

is false since phlogiston does not exist. There is one other important point which emerges, namely that existential loading is a contextual matter. In one context (α) yields a *Sosein* statement which is true, in another context it yields a *Sein* statement which is false. In some ways then, (α) resembles "I am hot" or "Sherlock Holmes lived in London", which in one context can be true, in others false.

In order to allow for both sorts of occurrences of subjects, those that carry existential loading and those that do not, and to make the differences explicit, singular expressions in example sentences and in symbolic expressions are assumed *not* to carry existential loading unless the loading is specifically shown. The familiar case where expressions do carry existential loading can be represented by superscripting component expressions which carry existential loading with "E", where "E" symbolises "exists". For example, the Cartesian argument

I^{E} think; therefore I exist

is admissible, but the argument with the premiss Descartes as sceptic had,

I think; therefore I exist,

is not. (Note that in "I^{E} exist" the superscripting is redundant.) When context is taken up syntactically, superscripting can be eliminated in favour of specific mention of existence

requirements by way of equivalences like (to use standard notation)

$$A(u^{\mathrm{E}}) \equiv . \quad A(u) \,\&\, E(u)$$
$$g((\imath^{\mathrm{E}}x)f(x)) \equiv g((\imath x)(f(x) \,\&\, E(x))).$$

In this sort of way superscripted expressions can be defined for each logical context for which they are required.

In everyday discourse existential loading is by no means always required; many everyday statements are *Sosein* statements.[1] And existential loading, where it is presupposed, is often contextually indicated and not stated. But in going further, in dropping existential commitment in *all* symbolic contexts unless it is explicitly indicated, a shift *is* made from work-a-day language to a natural extension of it.

The converse procedure of starting with existentially loaded expressions and then introducing by definition expressions which do not carry ontological loading, *ontologically neutral* expressions, appears to be impossible. At least if it is to be achieved without prejudging or prejudicing the content-value of certain expressions it appears impossible.[2] Russell's theory of descriptions cannot be viewed as a satisfactory attempt to introduce ontologically neutral expressions. For first the theory has to make exceptions for the ontological predicate "exists" and does not cater at all for other ontological predicates such as "is possible". Second, the procedure does, as we have already noticed, prejudge the truth-values of sentences which contain expressions purportedly referring to nonentities. At least where intensional functors appear in these sentences (as in "The mountain I am thinking of is golden" and "Weingartner believes the winged horse is winged") the procedure too often assigns the intuitively wrong truth-value, even allowing for scope artifices. Third, ontological commitment is not eliminated but merely transferred to quantifiers. Under the theory descriptions are only eliminated by way of logically proper names: but logically proper names carry, by their very definition, existential loading.

[1] It is for this reason in particular that Linsky's (Linsky 1967, p. 19) criticism of the Independence Thesis that "it neglects ... the implication that in talking about objects ... we are talking about objects in the real world" is mistaken. With *Sosein* statements there is no implication that what we are talking about exists; rather such a contextual implication is a feature of *Sein* statements. The expression "objects in the real world" is itself ambiguous. For the domain of objects $d(T)$ of the real world T of semantical analysis includes objects which do not exist: only a subclass of its objects, those of domain $d(G)$ of the real empirical world G, exist. For further explanation of the ambiguity see §17.

[2] The case argued in subsequent essays implies that it *is* impossible: see especially "The importance of not existing" [see Vol. 3 *—Eds.*].

Existential loading is carried in English chiefly by subject expressions. (Hence the attempts by logicians in the Russellian tradition to eliminate refractory designating expressions through predicates, e.g. "Pegasus" by "Pegasizes", "Venus" by "is Venus".) But certain predicates and quantifiers such as "exists", "there exists" (and "there are" in *some* occurrences) are used explicitly to state existential loading.[1] These predicates and quantifiers occupy a special position. They are not assumed, even in examples and symbolism, not to state existential loading. In fact their symbolic correlates are deployed *just* to specify existential status.

§4. Defence of the Independence Thesis.

The Independence Thesis, that items can and do have definite properties even though nonentities, is supported by a wide range of examples of nonentities to which definite properties are attributed. These attributions occur when people make true statements about items, and therefore ascribe properties to them, without assuming them to exist or knowing full well that they do not exist. These examples represent counterexamples to the Ontological Assumption, unless a successful reduction of the example statements to statements about entities is produced. They therefore provide a *prima facie* case against the Ontological Assumption.

Many examples of correct ascriptions of properties to nonentities occur in mathematics and in theoretical sciences (cf. TO, p. 98ff.). It is worth remembering that Meinong thought that mathematics was an important part, and the most developed part, of the theory of objects.[2] All of pure mathematics and much of theoretical science lie beyond the boundaries of the actual.[3] For scientists and others can, and regularly do, talk and

[1] Another set states its removal, e.g. verbs such as "is dead", "is not yet created", "is impossible", "is illusory" "is imaginary" and "has disappeared".

[2] The sheer importance of mathematics and the theoretical sciences and the apparent relevance of nonentities to these subjects is enough to shake some of Findlay's objections to nonentities and to Meinong's theory of objects: for these see Findlay 1963, p. 56 ff . Findlay makes no distinctions between nonentities with regard to their precision of characterisation or importance, and he fails to notice the important exact ideal items of mathematics and theoretical science, the study of which does much engage men of science.

Findlay's other "fatal weaknesses" in the theory of objects are examined in a later essay on objections to the theory.

[3] In two letters to Meinong, in 1905 and 1907, Russell expressed his agreement with Meinong's assertion that pure mathematics is an existence-free science (Kindinger 1965). And Russell advances similar views in *Principles*, e.g. p. 472, and p. 458 where it is said "mathematics is throughout indifferent

think very profitably about points in 6-dimensional space, imaginary numbers, transfinite cardinals and null classes, about perfectly elastic bodies, frictionless machines, ideal gases and force-free particles, without assuming or implying that they exist, without there being any clear case for claiming that they are reducible to items which do exist. The objects of theories, hypotheses, arguments, inferences and conjectures need not exist, and commonly do not exist.[1] When abstract models are used in sciences, as they so often are, elements of the models are very often not assumed to exist. For instance, many elements of imaginary collectives used in representing probabilities of individual events are known not to exist. With the harmonic oscillator model used by Planck in studying black body radiation it is not supposed that black bodies are literally made up of harmonic oscillators. If space is in fact quantized not all the limit and cut points of applied classical mathematics actually exist; but the truth-values of almost all statements of classical mathematics would be unaffected. Likewise, in systematic zoology imaginary link animals with intermediate features (certain *intermediate* taxa) play an important theoretical role, but they are not assumed ever to have existed.[2] *Theoretical items of science need not be* – and commonly are not – *theoretical entities.* .

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as to whether its entities exist". This is compatible neither with *Principia Mathematica*, where many existence claims appear (including such notorious axioms as those of infinity, choice, and reducibility) nor with Russell's later contention that in theories of objects

> there is a failure of that feeling for reality which ought to be preserved even in the most abstract studies. Logic, I should maintain, must no more admit a unicorn than zoology can; for logic is concerned with the real world just as truly as zoology, though with its more abstract and general features (Russell (MP, p. 17))

Logic is concerned with the real world, since it states logical truths, but not only with it (or with it other than as a certain sort of world). And just as systematic zoology can be quite properly concerned with imaginary animals and with universals (such as species), so logic can be – and indeed very much is – concerned with nonexistent objects.

Since moreover unicorns do not exist, they do not have to be ascribed existence in this or that way, e.g. in heraldry or in the mind, in the way Russell supposes.

The thesis that mathematics is – or should be – existence-free is much older, and is to be found, for example, in the Scottish philosophy of common sense. According to George Campbell in his *Philosophy of Rhetoric*.

> No "conclusions concerning actual existence" can be drawn from a mathematical proposition (Grave 1960, p. 118);

and according to Reid

> from no mathematical truth can we deduce the existence of anything; not even of the objects of the science (Reid 1895, p. 442).

[1] The subterfuge of saying that nonetheless these objects have mathematical existence is dealt with in the chapter on objections [see Vol. 2, chapter 4.3 *—Eds.*].

[2] See, in particular, the dispute between Gregg and others as to the intensionality of evolutionary taxonomy in *Systematic Zoology*, 1966 on. On the role of intermediate taxa, which need not exist, see, e.g. Hull and Snyder 1969.

We commonly enough, both outside and inside science, make true claims about objects without implying either that they exist or that they do not, or, in some cases, without knowing whether they exist or not. Thus sometimes the bracketing of existence assumptions is, so to speak, obligatory. Many of these claims correctly ascribe properties to nonentities. Consider, for instance, claims about such various objects as flying saucers and abominable snowmen, and (at appropriate times) aether, phlogiston, and Piltdown man. To determine whether aether, for example, exists or not, experiments (such as the Michelson–Morley experiment) are designed which rely on recognised properties of aether. As Meinong put it (UA, p. 79 [as translated in Chisholm 1973, p. 250 —*Eds.*]):

> If one judges that a perpetual motion machine [flying saucer] does not exist, then it is clear that the object whose existence he is denying must have certain properties and indeed certain characteristic properties. Otherwise the judgement that the object does not exist would have neither sense not justification.

Moreover without such an approach there are serious difficulties in accounting decently not just for our predecessors' statements regarding the false theories that litter the history of science, but for our present scientific situation: for some of our more extravagant theories may turn out to be false or about what does not exist.

> If we feel entitled to say that our ancestors quite literally did not know what they were talking about (did not know what they were attempting to name, what the external world contained), why should we assume that we are any better off? (Rorty 1976, p. 321).

The problem disappears once the assumption that, because "our inquiring ancestors often failed to refer (because they used terms like 'luminiferous aether', 'daemonic possession','caloric fluid', etc.) [they] produced statements which were either false or truth-valueless" (p. 334), is dropped, and it is admitted that the ancestors were sometimes talking, sometimes truly, about things that do not exist.

Also we commonly make true claims about the nonexistent objects of fiction, legends and mythology,[1] e.g. "Pegasus is a winged horse", "Pegasus was ridden by Bellero-

[1] There is a growing body of philosophical literature defending this commonsense claim; see, e.g. Cartwright's case (Cartwright 1963, p. 63 ff) for the truth of the statements "Fa ff ner had no fat" "Fa ff ner was the dragon Siegfried slew" and "Faffner did not (really) exist"; and Crittenden's defence (Crittenden 1970–71, pp. 86–8) of the truth "The cyclops lived in a cave".

phon", "Mr. Pickwick was a fat man", "Sherlock Holmes was a detective", and so on. Logically these objects have a good deal in common with the objects of mistaken scientific theories. Not only in the case of fiction and myth, but also in the discussion of these, in play-acting and role-acting contexts and in pretence situations, we commonly talk and think about objects that do not exist, and which, for the most part, we know do not exist. (Playing-acting and pretence situations lead on, however, to the very important classes of true intensional statements about nonentities.) The drive to eliminate or analyse away the true statements of fiction, legend, and so on, is exceedingly strong, so strong that many philosophers are prepared to sacrifice virtually all intuitive data concerning the objects of fiction. And, of course, given the Ontological Assumption it is essential to analyse such expressions away through some theory of fictions or descriptions if a pernicious platonism is to be escaped. For in *this* case platonism has to be avoided: to say that Pegasus exists or Mr. Pickwick exists conflicts with completely firm data. No one, certainly not any noneist, wants to claim that Pegasus exists.[1] Once an actual-denotation theory of meaning is completely abandoned, the forces pushing philosophers either into theories of fictions or descriptions, incomplete objects or incomplete symbols, on the one hand, or into platonic realism on the other hand, are dissipated. Then, and only then, an unprejudiced investigation of the logic of fictions can be made.[2]

Another familiar but striking case of discourse where properties are attributed to non-existent items is provided by talk of purely past and future items. Given that one rejects (as we shall in chapter 2) the perverse usage of the present tense "exists" under which a past item is said to exist now because it *once* exist*ed* and a future item because it *will* exist, one must say that purely past and future items do not exist. But past and future items nevertheless have very many definite properties. It is entirely correct, and reasonable, to say of Aristotle both that he does not exist (although he did) and that he has the property of having been born in Stagyra. Similarly for future items: the greatest philosopher of the 22nd century is not yet born, but he will study some philosophy.

Support for the Independence Thesis derives, next, from negative existentials, and

[1] Of course we can say if we like (like Crittenden 1970–71) – though it is misleading – that Pegasus exists in fictional space, and certainly we can claim that in some possible worlds Pegasus exists, since it is logically possible that Pegasus exists.

[2] It is not good enough, as we will see, to convert all fictional statements into intensional ones, e.g. to such forms as "Once upon a time . . . ", "It is written in *The Pickwick Papers* (that) . . . .", "*The Odyssey* says (that)", etc.

the like. When denials of existence are made, as, e.g. in "But Pegasus does not exist", "Mermaids don't exist", "No ghosts exist", the designating expressions could not carry existential loading. Otherwise all statements denying existence would be inconsistent, and all affirming existence redundant – consequences which plainly do not hold. This argument adapts an argument for existence not being a property. Other arguments adduced in favour of the misguided thesis that existence is not a property can also be converted into arguments for the IT. Similar points also hold good for assertions of possibility and impossibility; for instance, if "Rapseq" carried ontic loading in the true assertion "Rapseq is impossible" then the assertion would inconsistently presuppose both that Rapseq is possible and that it is not.

Nor can these conclusions be fully escaped by attempts to analyse away non-existence claims in the Moore–Russell way, namely by translating "ξ do(es) not exist", where ξ may be singular or plural, as "No existing thing(s) are (is) ξ" or "Everything that exists is other than (a) ξ", so reducing apparent nonexistence claims to quantificational claims only. For though it is true that the "translation" indeed furnishes a strict equivalence (under weak assumptions),[1] it does not preserve requisite features which are more intensional than modal; in particular, the equivalence does not preserve point, meaning and aboutness, and so it does not warrant intersubstitutivity in non-modal intensional contexts. The differences, however, between such sentences as

(i) Dragons do not exist,

and its proposed analysis

(ii) No existing things are dragons,

are not confined to the intensional (still less, as Grossmann 1974 supposes, to differences in the thoughts of those who express them). Consider (as in Griffin 1978) free logical models where (i) and (ii) differ in value assignment. In an empty domain on an expected intermediate interpretation, (i) will be true but (ii) will lack a value (or have "value" *gap*) on account of presupposition failure. The analysis fails entirely with statements that say that the domain of entities is null, such as "Nothing exists"; for what the analysis would

[1] In neutral logic, *in contrast* to more classical logics, this is readily proved, for example as follows in the singular case:
Everything that exists is distinct from a, symbolised $(\forall x)(x \neq a)$ is strictly equivalent, as its reading indicates, to $(Ux)(xE \supset .\ x \neq a)$, i.e., by contraposition, $(Ux)(x = a \supset .\ \sim xE)$. Hence, by instantiation, since $a = a$, $\sim aE$. Conversely, (since E is transparent) $\sim aE \dashv .\ x = a \supset \sim xE$, whence generalising and distributing (since x is not free in $\sim aE$), $\sim aE \dashv (Ux)(x = a \supset \sim xE)$.

lead one to expect, e.g. "Everything is non-self-identical" is logically false, whereas it is perfectly possible that nothing exists. (The latter assertion also strongly resists classical expression.) In a similar way to empty domain situations, (i) and (ii) are distinguished *contextually*; there are contexts (parallelling the models) where (i) holds but (ii) does not. Sentences (i) and (ii) also seem to differ in what they are *about*, (i) being about dragons and (ii) about all existing things.

Meinong (in Stell, p. 38) made essentially this objection to the analysis of "Ghosts do not exist" as "No actual thing is ghostly", namely that whereas the subject expression of the analysans is about pieces of reality the subject of the original is intended to designate "what does not exist and is therefore not a piece of reality at all". Naturally this is denied, vehemently, by reductionists,[1] who claim that a major aim and advantage of the proposed analyses is that they show that negative existentials such as (i) are not really about their apparent subjects. But as Cartwright in effect remarks (1963, p. 63) the questionableness of this claim

> is indicated by the linguistic outrage we feel at being told that (i) is not about dragons;

and he goes on to present some of the considerations which incline us to say that (i) is about dragons. (The underlying fact is that strict equivalence transformations need not preserve aboutness.)

The Moore–Russell analysis fails more conspicuously in intensional settings; for neither strict equivalence nor coentailment guarantee substitutivity salva veritate in such settings, so that a logic adequate for intensional discourse cannot dispose of negative existentials in the now classical way. Consider, to illustrate, Findlay's correct, but not uncontroversial, argument that

(iii) A philosopher's stone does not exist

cannot be satisfactorily analysed, preserving sense and content, as

(iv) Everything in the universe (i.e. that does exist) is distinct from a philosopher's stone.

[1] Thus, e.g., Broad 1953, p. 182 who comparing "Cats do not bark" with (i) says
> It is obvious that the first is about cats. But, if the second be true, it is certain that it cannot be about dragons, for there will be no such things as dragons for it to be about.

A person who wishes there were a philosopher's stone may wish

> not that any of the objects in existence should be other than it is, but that *some other object*, some object not comprised among the objects of our universe, but whose nature is nevertheless determinate in various ways, *should* be comprised in that universe, that is, should exist. (Findlay 1963, p. 53).

More formally, take as functor Ψ, "RR may now wish that it is not the case that"; then Ψ(iii) is true but Ψ(iv) is not (I can certify both).[1]

Examples like Findlay's can be multiplied. Consider the only person surviving after an explosion, who hopes for or seeks a companion. Or consider a person who could prefer that more things existed, or a person who simply desires that something that doesn't exist exists as well as just what does exist. Indeed it is, contrary to the Moore–Russell analysis, consistent that something which doesn't exist may exist while everything else that exists remains substantially the same.[2]

With intensional features we arrive at a rich, and important, class of features that nonentities may have. Intensional properties, of a range of sorts, are regularly, and correctly, attributed to nonentities. However debatable and hazy various features of the fountain of youth might be, it is established fact that it, and not some other item, was what was sought by Ponce de Leon. Ponce de Leon looked for something, and that something did not exist, which was why he failed to find it. He and many others believed it gave eternal youth, and this property of being believed to give eternal youth is unaffected by the fountain's failure to exist. People imagine, wish for, expect to see, seem to hear, hope to find, worry about, and fear items which do not exist. Even when such items do exist, the ascription of intensional properties to them often does not imply that they do exist. Intensional properties, then, typically carry no commitment to existence; we can as readily think of a unicorn as a bicycle.

[1] Semantically, the domain of existents, $e(T)$, of the actual world T is bound to remain fixed (though reductionists are tempted to say it has changed), but the domain of entities $e(w)$ of the situation w that RR may wish for or that Findlay envisages may include $e(T) \cup \{a\}$ where a is some object not in $e(T)$.

[2] Modal semantics with nonconstant entity domains will establish the basic point. But the larger issues then emerging are those of the correctness of such principles as the Barcan formula and that, developing from "substantially the same", of conditions for transworld identity. These larger issues are rejoined later, §17 ff.

Both Reid and Meinong[1] appeal to intensional relations in elaborating their case against the Ontological Assumption and associated prejudices. Reid argues thus (1895, p. 358):

Consider

> that act ... we call conceiving an object ... every such act must have an object; for he that conceives must conceive something. Suppose he conceives a centaur, he may have a distinct conception of this object, though no centaur ever existed.

A centaur, an object which does not exist, has nonetheless the property of being conceived by someone.

There are several distinctive classes of intensional predicates which serve to relate havers of intensional attitudes to non-existent objects of one sort or another. These include epistemic and cognitive functors such as "fears", "believes", "thinks", and "conceives", assertoric and inferential functors such as "infers", "asserts", "deduces", "includes", "hypothesizes" and "conjectures", and also, so it will be argued, perception terms. With perception verbs, such as "perceives", "sees", and "smells", it is not always legitimate to infer from the truth of the perception claim that the item perceived does (or does not) exist. The claim "a perceives m" may be true even when m is illusory or chimerical. In such sentence contexts the expression "m" very often does not carry any ontological loading. Special compounds like "seems to see", "appears to smell" are in fact commonly employed to do just such a job philosophically and ordinarily, in cases of mistaken, questionable, or tentative perception.

The intensionality of a subject predicate statement of the form $(a_1, \ldots, a_n)f$ may arise either (1) from the intensionality of the predicate or (2) from an intensionally-specified subject (or term) a_i[2] or (3) from both. (An intensionally specified term in turn involves an intensional predicate, i.e. it is of a form such as $(\tau x)xf$ where τ is a descriptor and f is an intensional predicate.) Let us consider in more detail some important cases

[1] Meinong was, it seems, initially motivated to develop a theory of objects because of the importance of nonentities of various sorts in descriptions and explanations of thought and assumption. Some of the important features of the intensional had already been emphasized by Brentano: indeed Brentano relied on them in his inadequate criterion of the mental. And, according to Meinong (GA, II, p. 383), it is of the essence of an intensional attitude that it may have an object even though that object does not exist: but this claim too is unsatisfactory.

[2] The subjects may be propositional expressions, of the form §p, i.e. that p where p is a sentence.

falling under these classificatory headings. Straightforward relational statements falling under heading (1), i.e. of the form aRb where a is a creature, R an intensional relation, and b a nonentity – that is, then, of the form bf where b is a nonentity and f an intensional property – from the first of the four types of statements that Chisholm distinguishes in his classification of "true *intensional* statements that seem to pertain to objects that do not exist" (1972, p. 30).[1] Statements of this type, e.g. Chisholm's

(a) John fears a ghost,

simply will not vanish, under paraphrase or reconstrual, into statements which can be seen to involve no such apparent reference to a nonexistent object. Can we find a reconstrual, or a paraphrase? "So far as I have been able to see, we cannot" (Chisholm 1972, p. 30). That we cannot will be argued in much greater detail subsequently; but it is not too difficult to see that none of the usual proposals for eliminating or absorbing the "misleading" term b can succeed. The reconstrual proposals are sometimes[2] prefaced by the claim that Meinong did not understand the use of nonreferring terms, such as "a ghost", in intensional frames, that he mistakenly supposed that the phrase "a ghost" has a referring use in (a).

> But just what was the mistake that Meinong made? He did not make the mistake of supposing that the word "ghost" in "John fears a ghost" is used to refer to something that exists or to something that is real (Chisholm 1972, p. 31).

The mistakes belong, in the main, to the usual reconstrual proposals, which are the following:

(α) Elimination of misleading terms (i.e. talk about nonentities) by way of theories of (indefinite) descriptions does not get to grips with examples, such as (a), of the form aRb. For as transcriptions such as $(\exists x)(x$ is a ghost and John fears $x)$ are patently wrong, the object term has to be enclosed by a predicate for the theory to apply, i.e. aRb has to be converted to something of the form $aR'[bf]$, e.g. to take a much favoured proposal

[1] Though Chisholm's distinctions will bear, like most bridges, only a limited load, they are most helpful for the present prima facie case for the IT, and will be taken over in what follows. The paragraphs which follow borrow very heavily from Chisholm's exposition in Chisholm 1972. All quotes not specifically indicated are from this exposition.

[2] Thus, for instance, Ryle in his work on Meinong and on systematically misleading expressions, and Findlay 1963, p. 343.

(a) is converted to

(a′) John fears that a ghost exists

But (a′), which is then transformed to "John fears §$(\exists x)(x$ is a ghost)" is not equivalent to (a): neither implies the other. The general failure of the conversion of aRb to $aR'\S bE$ to preserve meaning or even truth is evident from other examples, e.g. "John is thinking of Pegasus" cannot be rephrased preserving truth as "John is thinking that Pegasus exists". And in many cases such an existential conversion is not available, e.g. "John is looking for a goldmine". Conversion failure also means that paratactic analyses, such as Davidson's accounts of *saying that* and *believing that* do not apply, without a preliminary, and problematic, conversion, of aRb to $aR'\S bf$.

(β) Replacement of misleading terms by concept names, i.e. transformation of talk of nonentities into talk of concepts or properties. It is often suggested by those working in the Fregean tradition that "a ghost" in (a) is "used to refer to what in other uses would constitute the sense or connotation of 'ghost' ". Obviously (a) cannot be rephrased preserving truth as "John fears the concept of a ghost", since John may well have no fear of concepts. "John himself may remind us at this point that what he fears is a certain *concretum*", not some abstraction such as a concept or a set of attributes. No, the general proposal is that aRb be paraphrased as aR'(the concept of b), where R' is some new relation different from R, or, still more sweepingly and less assessibly, "as telling us that there is a certain relation holding between [a] and a certain set of attributes or properties. But what attributes or properties, and what relation?" The only way of explaining the new relation R', not only generally but in most specific examples such as (a), is by appeal back to R itself: R'(the concept of b) is explained in terms of Rb. The elimination presupposes what it is supposed to be eliminating. As Chisholm earlier remarks – a telling point that applies against several proposed analyses in both Fregean and Russellian traditions –

> It is true of course that philosophers often invent new terms and then profess to be able to express what is intended by such statements as "John fears a ghost" in their own technical vocabularies. But when they try to convey to us what their technical terms are supposed to mean then they, too, refer to nonexistent objects such as unicorns.

Furthermore Fregean replacements only succeed given a thoroughgoing platonism accord-

ing to which *all* concepts exist; for, for any object b whatsoever, it is true that someone may have been thinking of b. Such a thoroughgoing platonism is acceptable neither to noneism or nominalism or to positions forced into admitting that some concepts exist, and for good reasons (e.g. concepts of impossible and paradoxical objects do not have the right properties to exist).

(γ) Replacement of misleading terms by their names, e.g. aRb is replaced, in the first instance by aR"b", and then, since this is evidently inadequate (John may not fear the phrase "a ghost"), by aR'"b". Replacements of this sort are proposed by Carnap in the *Logical Syntax* (LSL, p. 248), e.g. "Charles thinks A" was to be translated as "Charles thinks 'A'", are entertained by Wittgenstein in the *Tractatus*, and are implicit in Ryle's criticism of Meinong in Ryle 1971, p. 225ff. and in Ryle 1972. The proposal is open to the objections lodged under (β) – e.g. "What ... would 'John fears a ghost' be used to tell us about John and the word 'ghost'?" – and to others, e.g. the familiar translation objections and quantification objections (see chapter 4 [reprinted in Volume 2 *—Eds.*]).

(δ) Absorption of misleading terms as parts of the predicates in which they occur, e.g. aRb is really about just a and of the form $aR{-}b$ with predicate $R{-}b$. Thus the phrase "a ghost" in (a) functions only as part of the longer expression "fears a ghost". The absorption proposed takes various forms. For example,

> it has been said that the word "ghost" in "John fears a ghost", is used, not to describe the object of John's fears, but only to contribute to the description of John himself. This was essentially Brentano's suggestion. But just *how* does "ghost" here contribute to the description of John? ... Surely the only way in which the word "ghost" here contributes to the description of John is by telling us what the object is that he fears (Chisholm 1972, pp. 252–3);

so the related object is not absorbed. Moreover the proposal gets into serious difficulties, as do all absorption proposals, over the inferences that can be made from (a). Since the object can be particularised upon, to yield "Something is feared by John" (generally, $(Px)aRx$), and alternatively identified, to yield "John fears a disembodied spirit" (generally, if aRb and $b = c$, for suitable identities, then aRc), the object term fills a full object role, and cannot be absorbed without destroying legitimate connections. It is just these sorts of things that are wrong with the hyphenation proposal according to which "ghost"

in "fears-a-ghost" has no connection with the occurrence of "ghost" in such sentences as "There exists a ghost" and "Charlie saw a ghost". Strictly, "ghost" no more occurs in the sentence than "unicorn" in "The Emperor decorated his tunic ornately" (Chisholm's example). For that the proposal is mistaken and that there is a connection

> may be seen by noting that "John fears a ghost" and "John's fears are directed only upon things that really exist" together imply "There exists a ghost" (Chisholm 1972, p. 253).

Chisholm's second type of intensional statement, which is exemplified by

(b) The mountain I am thinking of is golden,

includes not an intensional main predicate but an intensionally specified subject (which does include, however an intensional predicate). Such statements are a special class of those that fall under classificatory heading (2). It is easy to supply contexts in which (b) may be true, though the mountain in question does not exist. Again proposals for paraphrasing or absorbing the "misleading" object – proposals which, for the most part, parallel the proposal already rejected in the case of the first type – fail minimum adequacy tests. For example, Russell's theory of definite descriptions, applied in a straightforward fashion to (b), fails to preserve truth, for it transforms (b) to what is false, "There exists a unique x such that x is golden and I am thinking of x".

Chisholm's remaining two types of true intensional statements are very special cases falling under classificatory heading (2): they are identity statements of the form "a is identical with b" where both a and b are intensionally specified subjects, with the subjects concerning in the third type different persons and in the fourth type the same person. Examples of the type three and type four statements are respectively,

(c″) The thing he fears the most is the same as the thing you love the most,

(d) The thing he fears the most is the same as the thing he loves the most.

In fact the generating example for Chisholm's exemplification,

(c) All Mohammedans worship the same God,

of his third type of intensional statement, is

(c′) The God a worships is the same as the God b worships, for any Mohammedans a and b.

What these and other identity cases, such as

(e) What I am thinking of is Pegasus,

appear to show is that true identity statements can be about nonentities in a quite uneliminable way. Yet again Russell's theory of descriptions delivers intuitively wrong truth-values for such statements; and other paraphrases and reconstruals, where they work, are little, if any, better than Russell's theory. Thus Chisholm's conclusion (1972, p. 255) is apt:

> I think it must be conceded to Meinong that there is no way of paraphrasing any of [the intensional statements (c)–(d) exemplified] which is such that we know both (i) that it is adequate to the sentence it is intended to paraphrase, and (ii) that it contains no terms ostensibly referring to objects that do not exist, ... [And prevailing logical theory] is not adequate to the statements with which Meinong is concerned. But this fact, Meinong could say, does not mean that the statements in question are suspect. It means only that such logic, as it is generally interpreted, is not adequate to intensional phenomena.

Intensional features, though vital to the defence of the Independence Thesis, are however not enough. The appropriate inherence of intensional features in an object requires a non-intensional basis. Fortunately the necessary basis is readily discerned. For, to anticipate a little, an item can also be truly said to have the (extensional) properties by which it is characterised: this holds for a large range of (extensional) properties of nonentities. Thus the golden mountain is golden, a winged horse does have the property of being winged, and Meinong's round square the property of being round. As with logical properties it is possible to attribute such properties without assuming that the item to which they are attributed exists, because there is a way of deciding whether they apply without examining a referent; for instance by seeing whether they follow from the characterising description of the item. Both sorts of necessary properties, logical properties and characterising properties, can be properly attributed to nonentities because necessary truths can be established by a priori means.

Although there is nothing to prevent logical properties and characterising properties being attributed to nonentities, we do not claim that all such attributions would be immediately recognised by every competent speaker as completely natural or uncontro-

versibly correct. But the possession of such properties by nonentities must be recognised if we are to account for the attribution to nonentities of intensional properties, which are natural and indispensable. One of our arguments will be that the possession of logical and characterising properties by nonentities is a necessary pre-condition of their possession of intensional properties. It is an extrapolation from some natural language discourse which is necessary for its theoretical organisation and explanation.

It will, presumably, be objected against these examples that the subject terms are not really about nonentities, that the properties ascribed are not genuine properties. The main ground, however, for such contentions, the adoption of referential criteria (such as the possession of a property by an item under any description) for genuineness of property and subject, simply begs the question. It begs the question because if we *can* use some statements about nonentities, such criteria cannot be correct. The other main ground for this objection is the faith, already encountered with negative existentials, that such statements can be alternatively reconstrued as statements about existing items, so there is no need to take them as counterexamples to the Ontological Assumption. We shall have more to say on such reduction attempts later. But so far this programme is little more than a promise, since no such reductions have been satisfactorily carried out; while they remain mere promises – and promises which there is no good reason other than the Ontological Assumption itself and the mistaken theory of meaning on which it is based, to suppose capable of being met – such reductions cannot provide a good argument against taking these statements as about what they appear to be about, nonentities.

The case against the Ontological Assumption does not rest however, just on examples. Because we *distinguish* some nonentities from others, and also *identify* some with others, nonentities cannot be featureless, as the Ontological Assumption implies they are. They must have properties to distinguish them. Thus Pegasus is distinct from Cerberus, since one is a horse, the other a dog; and mermaids are different from unicorns.[1] On the other hand, because of coincidence of properties, Aphrodite is identical with Venus, and Vulcan with the planet immediately beyond Pluto. For the purpose of the argument it

[1] Not only can nonentities be distinguished and identified, they can be counted as Meinong remarked, e.g.

> "we can also count what does not exist" (TO, p. 79.)

And as Chisholm added:

> A man may be able to say truly "I fear exactly three people" where all three people are objects that do not exist (Chisholm 1972, p. 255.)

is only necessary to show that *some* nonentities are distinct from one another, not that there are never problems or indeterminacy about the identity and distinctness of nonentities. The truth of identity and distinctness statements about nonentities can *only* be adequately explained by supposing that the items themselves have properties. The same goes for likeness and unlikeness claims. Contrary to the usual supposition, differences in the associated concepts or senses of expressions – or worse still in the associated names – will not do. While we might be able to explain the truth of a distinctness statement such as "Unicorns are distinct from mermaids" by reference to the distinctness of the concepts *unicorns* and *mermaids* or the difference in the senses of expressions "unicorns" and "mermaids", we cannot similarly explain the truth of a contingent identity statement such as "What I am thinking about is identical with a unicorn" by reference to the sameness of the concepts or senses involved, because they are not the same. And to explain the truth of the identity statement by identity of reference, by saying that the concepts apply to or the expressions refer to the same items, is to push the responsibility for the truth of the identity back to the items themselves, and therefore to admit that the items must have properties. Yet unless some other *entities* can be produced whose identity or difference can explain such contingent identity statements, we will have to fall back on the identity or difference of the items themselves, which entails that they have properties.

To enlarge on the theoretical case against the Ontological Assumption is almost inevitably to detour into the theory of meaning. As theories of meaning which recognise two components of meaning, sense and reference, have some appeal, it is difficult to see why the Ontological Assumption should have remained largely unquestioned; for the failure of the Ontological Assumption is readily explained on such a theory. Suppose, as sense-reference theories do, that a subject-expression may have a sense but lack a reference. Since to have a reference is to exist, the theories suppose, correctly, that an expression "a" may have a sense though a does not exist.[1] But quite a number of properties accrue to a just in virtue of the fact that "a" has a sense. Because of the sense of "a", a will have analytical, logical, classificatory and category properties. Hence nonentities have definite properties. In virtue of the sense of "unicorn", unicorns are not the sorts of items that are prime or proved deductively though they are the sorts of items that are horned. Therefore unicorns have definite category properties. Also in virtue

[1] The argument is that if some item a, say, does not exist, the statement "a does not exist" must be true. But if the statement is true, the sentence must have a sense; so too "a" must have a sense though it lacks an *actual* designation, i.e. a referent.

of the sense of "unicorn", unicorns are necessarily animals. Therefore any given unicorn definitely has the property of being an animal, similarly any unicorn is necessarily a one-horned animal. It is partly in virtue of the sense of "a" too that a has its intensional properties, and is, for instance, thought about, feared, and believed to be red in colour. Of course not *all* properties can be possessed or lacked by an item a in virtue of the sense of "a" – some can only be had or lacked if "a" also has a reference, i.e. if a exists. Nevertheless it is enough that *some* properties may be possessed in this way, in virtue of "a"s having a sense, for then a will have properties even though it does not exist, contradicting the Ontological Assumption. The fact that the Ontological Assumption is so widely assumed and so rarely questioned is an indication, then, that reference theories of meaning have not really been supplanted by *genuine* second-component theories.

Along with sense properties, nonentities have other semantical features; e.g. the semantical statement "The word 'Einhorn' in German designates unicorns" ascribes such a property to unicorns. Both Meinong and Chisholm want to say

> that semantical statements are really a subclass of intentional statements, statements about psychological attitudes and their objects. ... To say that "*Einhorn*" is used to designate unicorns, according to Meinong, is to say that "*Einhorn*" is used to express those thoughts and other intentional attitudes that take unicorns as their object (Chisholm 1972, p. 251).

Avoiding this (understandable) confusion of semantics and pragmatics is important for the semantical theory to be developed. It is also important in meeting criticisms of the theory that the basic semantical relations, e.g. designating, being about, and so on, are not intensional or psychological. As a matter of definition of *intensional* they are not intensional: evaluation of "'a' designates a" involves no world shifts. Meinong and Chisholm are mistaken in claiming that semantical statements are intensional.

As well as semantical and sense properties, nonentities also have, as already remarked, logical properties. Thus, for instance, each nonentity is self-identical, and, because different from other nonentities, different from something; and in general nonentities exemplify logical laws. There is nothing about very many logical properties or the way they are determined which would limit their correct ascription to entities. For pure logical properties carry no commitment to existence. Moreover it is widely believed that

logic should take no account of, and indeed takes no account of, contingent matters. Why then should the possession by an item of a logical property, such as self-identity or membership of some set, have to depend upon the accident of the item's existing? But once again, logical features do not serve to distinguish nonentities, or even sorts of nonentities, from one another. That we do distinguish them is however evident from true intensional statements about nonentities, e.g. "Some primitive people fear ghosts but not mermaids". (Almost everyone knows the difference between a ghost and a mermaid, for all that logicians' theories of descriptions prove that they are the same.) So we are led again, ineluctably, to further extensional features of nonentities, and to a more thoroughgoing rejection of the OA.

Acceptance of the Independence Thesis and rejection of the Ontological Assumption have far-reaching philosophical consequences, as will become evident. For example, traditional and standard discussions of such items as universals and objects of perception and of thought are entirely subverted (see subsequent essays [in particular, Vol. 3, chapter 9 *—Eds.*]). Some more immediate and local effects are worth recording immediately.

A corollary of the Independence Thesis is – what Grossmann 1974, p. 67 considers a central doctrine of Meinong's theory of objects – that nonexistent objects are constituents of certain states of affairs. For if a nonentity has some property then it is a constituent of the state of affairs consisting of its having that property, and so a constituent of a state of affairs. In fact the constituency thesis is logically equivalent to the Independence Thesis (in property form). For, conversely, if a nonentity is a constituent of a state of affairs then it has a property, namely the property of being a constituent of that state of affairs. And exactly as an object can truly have a property even though it does not exist, so an object can be a constituent of a state of affairs which obtains even though it does not exist.[1]

A second corollary is that the thesis – a ffi rmed by Prior 1957, p. 31 and, in fact, quite widely adopted – that "a exists" is logically equivalent to "there are facts about a"

[1] The logic of the constituency relation accordingly differs from that of inclusion, and the part-whole relation to which it has sometimes been assimilated. Rather, a is a constituent of state of affairs ϕ iff ϕ is of the form $\psi[b]$ and a is identical, under criteria which permits replacement in ψ contexts, with b.

For a more comprehensive discussion of problems to which rejection of the thesis that nonentities are constituents of certain states of affairs lead, see Griffin 1978 and 1979.

is false.[1]

Similarly such arguments for the existence of universals as Moore's argument for the existence of Time from temporal facts (such facts as a's preceding b and a's happening at ten o-clock, e.g. Moore's having his breakfast at this time) get faulted. For they depend essentially on an application of the Ontological Assumption.

Another advantage accruing at once from the rejection of the Ontological Assumption is that the so-called "problem of negative existentials" is simply dissolved. Really the problem is generated by the Ontological Assumption, and disappears with its rejection. The problem is how can one truly make a statement about a nonentity, e.g. Pegasus, to the effect that *it* does not exist or: how can the statement "Pegasus does not exist" (symbolised, $p\sim E$) be both true and about Pegasus? The problem arises because $p\sim E$ being a truth about p, i.e. Pegasus, implies, by the Ontological Assumption, pE, whence, since $p\sim E$ implies $\sim pE$, a contradiction results. The basic trouble is of course that pE is not true, though $p\sim E$ is true, in conflict with the Ontological Assumption.

However, the traditional negative existential problem is directly generated not by the Ontological Assumption (OA) but by strict consequences of the OA such as the Aboutness-Implies-Existence Assumption (AEA), i.e.

(the statement) that af is about a implies (presupposes) that a exists.

The AEA follows from the OA using the truth that if a statement is about object a then, necessarily, a has some characteristic. Now if a is a nonentity then $a\sim E$, and so $\sim aE$ is true; but $a\sim E$ is about a, whence, by AEA, aE, contradicting $\sim aE$.[2] The problem is dissolved once the AEA is seen through: the assumption is strictly equivalent to the OA,

[1] On this thesis hangs Prior's case for the development of chronological logic in his idiosyncratic fashion. Given the Independence Thesis, Prior's case collapses. But this hardly matters at least as far as chronological logic is concerned; for within a neutral logic more appealing and comprehensive tense logics can be developed, as the next essay [reprinted in Vol. 2, chapter 2 $_{-Eds.}$] tries to show.

[2] Cartwright 1963, p. 56 gives, in effect, the following neat, and more general, formulation of the argument:
Let S be a negative existential, i.e. a denial that ξ exist(s), with ξ singular or plural, e.g. a class term such as "ghosts". (S may take various forms, e.g. "There are no such things as ξ", "ξ do(es) not exist", "No such object(s) as ξ exist(s)".) Suppose S is true. But
p1. S is about ξ;
p2. If S is about ξ, then ξ exist(s) [there are (is) ξ]
p3. If ξ exist(s), S is false.
Therefore, S is false.
The argument from p1–p3 to the conclusion is valid, but p2 is false. If however "ξ exist(s)" is replaced, as in Cartwright's actual formulation, by the bracketed clause "There are (is) ξ" then the argument can

and accordingly open to the case against the OA. For, to complete the argument for the strict equivalence, if object a has some feature then the statement that a has this feature is about a. A corollary is that once the Ontological Assumption is abandoned a theory of aboutness, where a statement may well be about items that do not exist, can be devised without obstacles such as the AEA (for such a theory, see Slog, chapters 2 and 3).

The ancient riddle of non-being – according to which "non-being must in some sense be; otherwise what is it that there is not?" (Quine FLP, p. 2) or "whatever we can talk about must in some sense be something; for the alternative is to talk about nothing" (Linsky 1967) – likewise depends on equivalents of the Ontological Assumption; for the "riddle" is little more than a restatement of the negative existential problem. Granted that the nonentity Pegasus has to be something, e.g. a horse, it does not follow as the Ontological Assumption would have, that it has to exist or be. The (grammatically encouraged) argument from "a is red" or "a is a red object" to "a is" (i.e. from *Sosein* to *Sein*) is as invalid as the argument from "a is a good burglar" to "a is good". There is no reason, then, to say that Pegasus must in some sense be or have being, and there are good reasons for avoiding such terminology; e.g. the apparent commitment of the terminology to subsistence or kinds of existence doctrines and the lack of any contrasts of

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be given true premisses, but at the cost of equivocation on "there are" as between existentially-loaded and unloaded forms, p2 and p3 becoming respectively (in plural form):
p2′ If S is about ξ, then some things are ξ; and
p3′ If there exist (some existent things are) ξ, S is false.
The middle term is different: so this argument has obtained its appearance of soundness by equivocation.

So far all this makes the dissolution proposed look rather like what Cartwright calls an Inflationist answer. It is not; and the choice between Inflationist and Deflationist accounts is a false choice (as Cartwright's own suggestions, especially p. 66, should make plain.) No inflation of what exists is suggested: It is not being said with the Inflationists (the paradigm of whom is Russell of the *Principles of Mathematics*) that there are two kinds of existential statements, the second of which are affirmations or denials of *being*, as distinct from *existence*. Noneism is quite di ff erent from, and opposed to, such a levels-of-existence position. Though "Dragons do not exist" (Cartwright's (9)) is about dragons, the noneist is *not* led, as the Inflationist is, to affirm the being of dragons. There is only one way of being, namely existence. It is true, however, in virtue of M1 that "a is not an object" is always false or meaningless (in a way parallel to Russell's "A is not"): it is nonsignificant where a is a nonsignificant subject, such as "the weight of nine o'clock".

Finally, noneists can largely agree with Cartwright about the contrast between two sorts of negative existentials (and between sorts of designation), those that specify, or involve the specification of, particulars and those that don't, though they won't put the contrast in quite his way. As against Cartwright, "The man who can beat Tal does not exist" is about the man who can beat Tal, just as "Faffner did not (really) exist" is about Faffner; even so one who affirms the first does not purport to single out a particular thing in the way that one who affirms the second usually does (cf. pp. 62–5).

being in the wide sense.[1] The riddle is given apparent depth by a play on such quantifiers as "what","there is", "something" and "nothing", as between referential and nonreferential readings. For example, in talking about Pegasus, one is not talking about nothing, no item, though one is talking about nothing actual, no entity; what item it is that does not exist is, in this case, Pegasus, but there is no such entity as Pegasus.

The problem of negative existentials may be restated in quantificational form as follows: If "Pegasus does not exist" is indeed about Pegasus then, by existential generalisation and detachment, since the premiss is true there exists an item which does not exist, which is impossible. But where a does not occur referentially in "af" the principle of existential generalisation

af implies $(\exists y)yf$

is invalid. Nor does the fact that "af" is about a license existential generalisation; for aboutness does not imply existence. What is correct is the principle of particularisation:

af implies $(Py)yf$, i.e. for some (item), yf,

and hence, since $(\exists y)yf$ is strictly equivalent to $(Py)(yf \ \& \ yE)$, the free logic principle

$af \ \& \ aE$ implies $(\exists y)yf$.

The quantificational restatement of the problem of negative existentials fails then because existential generalisation (EG) fails. Given the breakdown of EG, it also becomes a simple exercise to expose all the usual reductionist arguments to the effect that it is impossible to make true statements about nonentities, arguments which help produce the "problem". Consider, for example, the following familiar argument: If a statement is to be about something that something must exist [an invalid use of Existential Generalisation]; otherwise how could the statement refer to *it*, or mention *it* [an illegitimate restriction of objects to entities, and of aboutness to reference]. One cannot, the argument continues, refer to or mention *nothing*, which is what making a true statement about a nonexistent object would amount to [another illegitimate use of EG, coupled with an illegitimate restriction of quantifiers to existentially loaded ones, of "nothing" to "nothing existent"].

The rejection of existential generalisation is a major logical outcome of the rejection of the Ontological Assumption: it is also a rejection with far-reaching philosophical

[1] The real worry behind the riddle is as to how an item or "thing" can be other than a referent, an entity. Hence the equation of no thing with no entity and some thing with some referent. The real worry the Advanced Independence Thesis is designed to remove.

impact. The illegitimate use of existential generalisation, in arguing from a nonreferential occurrence of a subject to an existential claim, is a fundamental strategy not only in the problem of negative existentials but also in many other metaphysical arguments, e.g. in standard arguments for God and universals, for substance and self. Consider, to illustrate, Chisholm's argument from Hume's bundle theory of self to the existence of a metaphysical or transcendental subject, the self.

> When Hume said that he, like the rest of mankind, is "nothing but a bundle or collection of different perceptions", he defended his paradoxical statement with the following words: "For my part, when I enter most intimately into what I call *myself*, I always stumble on some particular perception or other, of hot or cold, light or shade, love or hatred, pain or pleasure. I can never catch *myself* at any time without a perception, and can never observe anything but the perception". These words are paradoxical, for in denying that there is a self which experiences all of his perceptions, Hume seems to say that there *is* such a self (Chisholm 1960, p. 19).

That is, in formulating the evidence for his thesis that the there exists no self, only perceptions related in certain ways, Hume refers to a self which *has* these perceptions, whence by EG, there exists a self. Hence, by reductio $(\sim A \rightarrow A) \rightarrow A$ (there is no paradox), the self exists. Hume undoubtedly is in trouble because of his commitment to the OA; nonetheless the famous arguments deployed by Kant and Russell (cf. Chisholm 1960, p. 20ff.) to show the existence of a transcendental self depend upon faulty applications of EG. The fact that I myself have properties does not entail that there exists a self.

Given the Independence Thesis many commonplace arguments, both major and minor, about nonentities, apart from EG, are rendered unsatisfactory. As we proceed we will find that the OA is respectably applied in philosophical argument: indeed it is not going too far to claim that it is the main ontological method in philosophy, the main method of arguing to existence, with the Ontological Argument to a necessary existent only the most blatant example of its application. As a minor example of the effect of the IT, the following sort of argument is undermined: The round square does not exist. Therefore, since, by the OA, nonentities do not have properties, such as roundness, it is false (or without truth-value) that the round square is round. The fact that such argu-

ments fail is important in removing initial objections to the Characterisation Postulate.

Once the Ontological Assumption is completely abandoned (the concept of) *existence* can stop serving as a philosophers' football; we can stop playing ball over what does and does not exist. For what we say as to whether something exists will have much less bearing on what we can say about it, upon its features. We can foresake the easy platonism that even nominalists sometimes slip into over mathematics; for we have nothing to lose (in the way of discourse) by taking a hard, commonsense line on what exists, e.g. that to exist is to be, and to be locatable now, in the actual world. We are no longer forced to distinguish being or existence from actuality or to extend "exists" beyond this sense, e.g. to numbers and to the ideal items of theoretical sciences, simply in order to cope with the fact that apparently nonexistent items figure fruitfully in many calculations and in much theory: for we may retain the (perhaps redrafted) theory while admitting that the items do not exist.[1]

§5. The Characterisation Postulate and the Advanced Independence Thesis.

The particular quantification of the Independence Thesis invites the question: which features do nonentities have? The defence of the Independence Thesis has already provided a partial answer: important classes of attributes that nonentities have, and share with entities, are intensional features, (ontological) status features, identity, difference and enumerability features, and logical features. But in order to have such features as these, nonentities must have other features which characterise them.[2] For example, in order that the planet Vulcan is distinct from Pluto, Vulcan must have extensional properties, such as mass and path, different from those of Pluto; and it was in fact concluded that Vulcan did not exist because empirical investigation disclosed no actual planet with these properties. In order that I can think of a unicorn without thinking of a mermaid, unicorns must have, as we know they do, different extensional properties from mermaids, and in thinking of a unicorn, or of a non-actual animal of importance in theoretical taxonomy, I am not thinking of nothing, though I am thinking of nothing actual, but I am thinking of an item with certain non-intensional characteristics such as being mammalian

[1] All these points will be much elaborated in what follows.

[2] This transcendental argument for the Characterisation Postulate – that its holding is a necessary condition for nonentities to have the other properties that they have – is elaborated in later essays [see, especially, Vol. 2, §6.4 *—Eds.*].

and having hooves. That nonentities do have those features which characterise them is explained and guaranteed by the Characterisation Postulate, the fundamental principle M6 of Meinong's theory of objects.

Sometimes, as we have seen (e.g. the quote at the beginning of the essay) Meinong included in his presentation of the Independence Thesis instances of this further principle, the Characterisation or Assumption Postulate, a principle which, at least as applied to nonentities, is very distinctive. Indeed there is *a way* of reconstruing the Independence Thesis, as the principle that objects *have* their essential characteristics independently of existence, which includes the Characterisation Postulate. According to the Characterisation Postulate objects, whether they exist or not, actually have the properties which are used to characterise them, e.g. where f is a characterising feature, the item which fs indeed fs. In setting up a logical theory the Characterisation Postulate (CP) has, however, to be distinguished from the full Independence Thesis (IT); thoroughgoing nonexistential logics satisfy the IT but not any very general forms of the CP, and getting a correctly qualified form of the CP is a more difficult matter than simply incorporating rejection of the OA, which is quite straightforward.

An existentially restricted form of the Characterisation Postulate is an important ingredient in modern theories of descriptions;[1] the extension of the principle to nonentities, and particularly to impossibilia, is, as Meinong realises, an essential step in giving nonentities the status of full subjects, in making them more than logical dummies.

For the Characterisation Postulate provides a licence to do in any particular case what the IT indicates more generally that one should be able to do, namely to take any description which is legitimately constructed (i.e. which is characterising or *assumptible*) and employ it in the subject role to obtain distinctive true statements concerning the object it is about, namely those assigning to the object the characterising features its proper description assigns to it. Thus the Characterisation Postulate assigns to nonentities properties other than logical and intensional features; it extends to nonentities

[1] For instance, the basic inference rule for *proper* descriptions in Kalish and Montague 1964 is just a version of the CP qualified by the condition that there exists a unique object satisfying the description; an important application is the scheme:

$$\frac{(\exists y)(\forall x)(A(x) \equiv x = y)}{A(\imath x A(x))}$$

the privilege commonly only given by logical theories to entities, of having the features specified by their descriptions. In particular, if the description includes assumptible extensional features, e.g. "is a square" or "is round", then the object has these features.[1]

Thus the object which is round is round, and the round square, which is an object which is round and square, is round and square. A little more generally, an x which (is) f (is) f, and the x which (is) f (is) f, *provided* f is assumptible. By no means all predicates are assumptible, as will quickly emerge from intuitive considerations. But an important class of assumptible predicates – which covers the main, and controversial, examples of assumption that Meinong gave – are the elementary predicates, in the sense of Whitehead and Russell (PM, *1).

The Characterisation Postulate is fundamental for Meinong's distinctive position, e.g. on the philosophy of mathematics and of theoretical sciences: it explains how it is that mathematical and theoretical abstractions such as numbers and regular polyhedra, which do not exist, need not be assumed to exist in order to have their distinctive properties. It explains, in short, how mathematics is possible, and can operate: namely, by assumption. Similarly it explains how pure theoretical science is possible. More explicitly, the CP enables mathematical and other theoretical objects to have the properties ascribed to them, but without the usual platonistic assumptions; it provides a formal basis for mathematical postulation and construction without unwarranted existence assumptions. The Characterisation Postulate also explains what would otherwise be a problem for Meinong (since on his account nothing necessarily exists), how mathematical objects have their properties necessarily and not as a contingent matter, and how it is possible for properties of mathematical objects to be held extensionally. There are other important applications of the Characterisation Postulate which Meinong did not make, most of them deriving from the fact that the postulate makes it possible for nonentities to have extensional properties (see the explanation of extensional identities between nonentities given below).

As working examples of the CP let us take the following elementary cases, all of which Meinong would have approved:

(1) Meinong's round square is round

[1] The fact that it has the features necessarily or *a priori* does not make the properties themselves intensional.

(2) Meinong's round square is not round (because square)

(3) The golden mountain is golden

(4) Kingfrance is a king.

The argument – an argument from characterisation and meaning – for these truths is simply that if f is a characterising feature of a then af is true. For an item has, necessarily, those properties which characterise it. In more formal mode, if being f is part of what is meant by "a" then af is bound to be true, in virtue of the sense of a. For instance, the description "the golden mountain" has a sense, since it is a nonparametric component of (3), and (3) is significant and has a sense. By "the golden mountain" is meant "the mountain which is golden", in other words "the mountain of which it is true that it is golden". But mustn't it be true of this (nonexistent) mountain that it is golden? If so, (3) is true.

The same considerations help show that the following examples are NOT cases of the CP:

(⊣ 1) The round square which exists exists

(⊣ 2) The most perfect entity is an entity and most perfect

(⊣ 3) The oil rig 10 miles south of Capetown^{E} is 10 miles south of Capetown^{E}.

Mere characterisation on its own cannot determine what exists or how things actually are interrelated. Of course once it is determined *what* something is then it can be found out whether or not it exists, where, if anywhere, it is, and what it is identical with. The rejected examples violate these principles. In case (⊣ 1), for instance, an impossible object presents itself, through its description, as also existing: but an object cannot decide its own existence by describing itself as existing, any more than a person can change his height or status by describing himself as of a different height or status. There are several corollaries which emerge from such rejections, the most obvious being that *existence is not a characterising feature*. In fact existence is only one of a larger and important class of properties – *ontic or status properties* – which are not assumptible. Other status predicates are, for example, "is real", "is fictional", "is possible", "is created". The features such predicates specify are not assumptible, but rather supervenient or consequential; in particular, nonexistence and impossibility are consequential on roundness and square-

ness, and existence is consequential on suitable determinacy of elementary properties.[1] Existence, like identity, is a supervenient (or higher-order) property dependent on a class of elementary (or first-order) properties; thus, for example, one can no more have two items which are exactly the same in every respect *except* that one exists and the other does not, than one can have two items exactly alike in every respect except that one is identical with another individual and the other is not. Existence and identity are not simply further properties on a par with roundness and goldenness.

The standard (allegedly fatal) objections to Meinong's theory of objects – mostly repetitions of or variations on Russell's two objections that the theory engenders invalid ontological arguments and contradictions – all inadmissibly apply the Characterisation Postulate using predicates which are not assumptible. For example, it is alleged that the theory is inconsistent because on it the round square which exists both exists, since it says it does, and does not exist, since it is round and square: but the objection illegitimately applies the CP to the ontic predicate "exists".[2]

Since a theory of nonexistent *objects* depends on assigning distinct properties to distinct objects, it depends – so a transcendental argument will show – on accounting as true statements like (1)–(4). That there is no entirely conclusive argument for assigning (1)–(4) the truth-value true, should be expected especially in the light of rejections (⊣ 1)–(⊣ 3). And it can be proved, after a fashion. For any argument can be broken by (new) distinctions from rival theories (typically from the Reference Theory) which show the argument to involve equivocations (a classic example is the distinction between the "is" of identity and the "is" of predication). But no more is there a conclusive case for

[1] The line developed here is *one* of the lines indicated by Meinong.

[2] The objections will be examined in much greater detail subsequently, and shown wanting. It will also be argued:
(1) Meinong, especially in his later work, restricted the CP; so the standard objections do not work against him any more than they succeed against the theory of items.
(2) The idea that the CP is, or should be, unqualified is a further hangover of the Reference Theory. If items were referents just like entities then they would like entities be fully assumptible. Hence a contradiction in treating items just as further referents.
(3) Classical logic has, in effect, a restricted CP for definite descriptions, *one half* of which can be kept, namely $(\exists!x)\ xf \rightarrow (\imath x\ xf)f$, i.e. entities are fully assumptible. In virtue of (1)–(4), the converse of the classical connection is of course rejected. Likewise the theory of items has a different restricted CP. Only a totally naive theory would have an unrestricted CP. The situation is a *bit* like set theory; and in fact an unrestricted CP yields an unrestricted abstraction axiom (and much more).

assigning them the value false, or some other value. There are, however, reasons and arguments for the assignments adopted.

An initial reason, linked with the argument from characterisation, is that assignment true is an, perhaps *the*, intuitive assignment to make to (1)–(4). Ask the philosophically untutored whether the golden mountain is golden and you will commonly get the answer that it is. Ask them whether it is true the man who squared the circle squared the circle and you will mostly get, not Russell's answer that it is not true (PM, p. 14), but the answer that it is true. Ask them whether the round square is round and square or what its shape is, and you will find that, though it is considered impossible or even curious, it is usually accounted round and square. That the intuitive assignment to (1)–(4) is value true, does not however show that it is the "correct" assignment (since the data is not sufficiently hard). It is less clear than it should be, after all the continuing discussion of the relevance of ordinary language and everyday assignments, what the intuitive data does show. What it does indicate is that a theory that makes the assignment true to (1)–(4) is likely, other things being equal, to approximate decidedly better to the data that a logical theory of discourse (and language and thought) has to take account of than one that does not. And this will be confirmed as the theory unfolds.

Meinong's view, that

> though it is not a fact that the golden mountain or the round square exists, ... it is unquestionably a fact that the golden mountain is golden and mountainous, and that the round square is both round and square.

undoubtedly, as Findlay goes on to remark (1963, pp. 43–4), enjoys much initial plausibility. Thus if appeals to plausibility and to ordinary intuitions and assignments are to carry any weight, a theory which would bring out (1)–(4) as true would seem preferable to a theory like Russell's theory which assigns these value false, and a theory which assigns some truth-value decidedly preferable to one which assigns none.

Whatever the intuitive assignments, some values must be assigned to each of (1) to (4) – even if the value assigned is, for example, X (for: does-not-arise, neither true nor false, (truth-value) *gap*, or the like). For the sentences concerned do express propositions, since what they express can, quite unproblematically, be believed, denied, inferred, and so forth. These propositions must be either true or false or, should bivalence fail, X.

But the theories based on the last assignment are not (as already argued in §2) nearly as well-supported as bivalence for propositions, or, what usually corresponds syntactically, the law of excluded middle: nor have they been worked out in requisite detail. For example, where X represents the value does-not-arise, even the truth-tables for sentential connectives like "&" and "or" remain in some doubt. This naturally increases the difficulty of arguing against the adoption of such an assignment. It appears, however, that many logical anomalies would result, especially over negation and existence, over intensional functions, and over the interconnection of conditionality and consequence, and that intuitively acceptable arguments would be destroyed, including e.g., the Tarski biconditionals such as that A is true iff A.[1] In any case the assignment of X violates a version of the independence principle; for whether it is true or X that Kingfrance is king depends just on whether Kingfrance exists. Similarly the assignment of false to (4) violates such an independence principle. For if (4) is analytic-like when the existence requirement is satisfied, then (4) should hold when the existence requirement is not met – if the having of characterising features is to be properly independent of existence.

Which of the values, true or false, is assigned to each of (1)–(4) cannot be settled by empirical investigations; for the intended subjects are not to be located in ordinary space-time. The issue, in some ways like a conflict issue, has to be resolved – since (pace Strawson 1964, p. 106) resolved it needs to be for logical theory – by other means, by logical and theoretical principles and considerations. Some arguments and factors which weigh in favour of the assignment true to each of (1)–(4) will next be developed. How if the value false is assigned to (1) can one satisfactorily argue by direct methods, that Meinong's squound (i.e. round square) does not exist? The intuitive argument would run: Meinong's squound is round: Meinong's squound is not round. Therefore, since an item which is both round and not round does not exist, Meinong's squound does not exist. An assignment of the value false to (1) and (2) would destroy this very natural argument; for false premisses cannot be detached. The classical argument for the nonexistence of Meinong's squound is either unsatisfactorily indirect – it supposes that Meinong's squound does exist and then applies the CP for entities – or else introduces, what is in fact at issue, a theory of descriptions which analyses Meinong's squound away. Less intuitive arguments to establish the non-existence of Meinong's squound also meet

[1] On the latter points see, e.g. van Fraassen 1966, p. 492 and p. 494. On the former see, e.g. Nerlich 1965.

difficulties. Suppose it is argued: It is false that Meinong's squound is round; it is false that Meinong's squound is not round. If it is false that an item is round and false that it is not round then the item does not exist. Therefore Meinong's squound does not exist. But first, the last stage of this argument would be unable to discriminate between Kingfrance and Meinong's squound; between the possibility of the first and the impossibility of the second. Secondly, how is it concluded that the statement "Meinong's squound is round" is false? On the theory we should have *already* to know, what we are trying to establish, that Meinong's squound does not exist. An unpleasant circularity appears in the argument. With the CP such problems are avoided.

There remain other plausible arguments for the CP, upon which however even less weight can be put, for two reasons. Firstly, they are easily faulted by devices that have been long developed and refined by the opposition to meet such arguments. Secondly, the arguments, unless qualified in a way that begins to interfere with their plausibility can do too much, e.g. by pointing to unguarded versions of the CP. One such simple argument for (1) runs as follows: Let x be a subject variable. Now if x is Meinong's round square, then x is round and square, by the logic of predicate modification. Therefore, by simplification, x is round. Therefore, since Meinong's round square *is* Meinong's round square, it is true that Meinong's round square is round. This follows by generalisation upon "x is Meinong's round square, so x is round", and by instantiation with "Meinong's round square". Similar initially appealing arguments can be devised for the truth of (2)–(4). There are, however, orthodox ways of blocking these arguments, for example, by distinguishing identity from predication, and denying Kingfrance is Kingfrance, and more generally $b = b$ where b is a non-entity.

Finally (1)–(4) may be defended by appeal to the sense of component expressions. For instance, the description "the golden mountain" has a sense, since it is subject component of (3), and (3) is significant and has a sense. By "the golden mountain" is meant "the mountain which is golden", in other words "the mountain of which it is true that it is golden". But mustn't it be true of *this* mountain that it is golden? If so, (3) is true. Generally, if characterising feature f holds of a in virtue of the sense of "a", then af is true.

Like the Independence Thesis, the Characterisation Postulate has several controversial consequences of substantial philosophical interest. One is the *Advanced Inde-*

pendence Thesis, that nonentities commonly have a nature, a more or less determinate nature. For appropriately characterised nonentities will be assigned natures by the CP, inasmuch as each is credited with a set of (necessarily held) extensional features. The amalgamation of the features of a given set can be said, not implausibly, to furnish the (extensional) *nature* of the nonentity whose set it is. Plainly many such nonentities will have rather indeterminate natures, since their characterisations leave many respects undetermined. For instance, the round square is indeterminate as to the length of its side, as to its diameter, as to its colour and in most other respects, its nature being given by the features of roundness and squareness and their joint consequences. Nonetheless some nonentities, e.g. geometrical objects of mathematical interest such as the Euclidean triangle and all regular polyhedra, have quite rich, even if simple and austere, natures. It should be observed that "nature" is being used in precisely the relevant dictionary sense, according to which an object's nature is the "thing's essential qualities" (see OED), or, a little more broadly, the thing's essential and characteristic features. Given an object's nature, it is possible to specify (by deductive closure) the object's *essence*, i.e. "all that makes a thing what it is" (OED again).

An outcome of the Advanced Independence Thesis (AIT) is that the issue separating existentialism and neo-thomism as to whether existence precedes essence, or vice versa, is settled, by noneism, if not exactly in favour of the neo-thomism, *against* existentialism. The core existentialist thesis[1] that existence precedes essence is false. For, firstly, a nonentity may, by the AIT, have a definite nature though it does not exist. The existence of an impossible object, such as Rapseq, cannot precede its essence, in any satisfactory sense of "precede", since it has an essence without ever existing. Secondly, in order to determine whether a thing exists or not, to seek it out or look for it, we commonly need to know *what* it is: essence is, in this respect, epistemologically prior to existence. None of this is to deny that existence often makes a *substantial* difference to

[1] Moreover, as Sartre and numerous others have repeatedly insisted, there is, in fact, no need for all this vagueness and obscurity [as to what existentialism is], since an extremely simple, literal, and precise definition of existential philosophy is easy to come by and easy to remember. Existentialism is the philosophy which declares as its first principle that existence is prior to essence. (Grene 1962, p. 2).

The claims made on behalf of this definition, that it is simple, literal and precise, are hardly to be taken seriously, as an attempt to spell out the slogan soon reveals. The existential first principle, for example, upon called for elucidation, turns into, among other things, the obnoxious chauvinistic value thesis that the particular fact of individual *human* existence ranks above practically all else, certainly above all connected with essences and species.

an object and to its character; e.g. removal of existence by death or destruction can make the difference between a lively energetic creature and a lifeless object that was, (even briefly), before, that creature.

Not only does existence not precede essence, but existence is never an essential or characterising property of objects (of course it can be a distinctive feature of something that it exists). So emerges Meinong's contingency axiom, $\sim\Box xE$, nothing necessarily exists. The axiom is not however a consequence of the CP or restrictions upon it, though the restrictions upon it are an important part of the case for the axiom. For the restrictions block the main (and, so it will emerge, basic) logical way in which necessary existence of an object might be established. Conversely, the axiom forces restrictions on the CP, notably the exclusion of existence as an assumptible feature. For suppose that an item a's having some characterising property entailed that a exists. Since items have their properties necessarily it would follow that a necessarily exists, contradicting the axiom. The axiom itself may be defended in a quasi-semantical way: Consider any item a at all; then a consistent situation can be envisaged or imagined without a, or where a does not exist. But the fuller case for the axiom must wait upon the analysis of existence, and the exclusion of other ways of establishing necessary existence than by assumption principles.

The scholastic thesis that *essence does not involve existence*, where involvement is construed as entailment – a consequence of the thesis that essence is logically prior to (or precedes) existence – does emerge then: but in a qualified form, where an object's essence is construed narrowly in terms of its necessary features (the OED construal of *essence* properly allows for non-necessary nomic features). For the essence of an item comprises some sum or conjunction of the essential (usually necessarily held) properties of an item; and an item's having these properties does not, by the contingency axiom, entail that it exists.[1]

It is the *Advanced* Independence Thesis, not the Independence Thesis, that entitles one to apply such terms as "object" and "thing" to talk of nonentities: for in virtue of the AIT nonentities are thinglike and have a character. Strictly speaking then, the AIT

[1] Some of the traditional arguments for the scholastic thesis also support the Independence Thesis. For instance, the argument that finite items may come into existence (in this sense their essence literally precedes their existence) and cease to exist without thereby gaining and losing their essence, does show that the essential properties of an item, as distinct from contingent (status) properties such as coming into existence, do not conjointly entail existence of the item.

is required in making good the distinctive thesis M2 of Meinong's theory that very many objects do not exist in any way at all. Without the AIT it could be plausibly contended that Meinongian-objects are not really objects. Given the AIT such a contention is hard to sustain, except through an illicit high redefinition of "object", e.g. as "entity".

But the most important consequence of the AIT and IT is that the Reference Theory, a pervasive and insidious philosophical theory, is false.

§6. The fundamental error: the Reference Theory.

The Ontological Assumption is a major ingredient of the Reference Theory of meaning, according to which all (primary) truth-valued discourse is referential. For the Ontological Assumption claims, what is part of the Reference Theory, that in order to say anything true about an item its name or description must have an actual reference. Not only has there been a failure to appreciate the true nature of the Ontological Assumption; worse, theories which, like Meinong's, reject the Ontological Assumption are commonly accused of embodying the Reference Theory. This inversion of the true state of affairs is due to a serious confusion as to what the Reference Theory amounts to. Part of this confusion is due to an ambiguity in the use of the word "refer" (and likewise in the German "Bedeutung"). The word "refer" is used in everyday English (see OED), in the relevant sense, to indicate merely the subject or topic of discourse, or subject-matter, or even more loosely what such discourse touched upon or what was drawn attention to or mentioned. *Any* subject of discourse can count as referred to, including nonentities of diverse kinds; in this sense there is no commitment to existence. Superimposed on this non-theoretical usage we have a philosophers' usage which embodies theoretical assumptions about language, according to which the reference of a subject expression is some existing item (an extensionally characterised entity) in the actual world.

The assumption that the two usages, the everyday and the philosophers', are co-extensive smuggles in, superficially as a matter of terminology, an important and highly questionable thesis about language and truth. If one wishes to reject the assumptions made in identifying these two relations, one must adopt terminology which makes it possible to distinguish them: in the circumstances there seems little alternative but to henceforth reserve the term "refer", which has become loaded with assumptions as to existence and transparency, for the restricted relation and to adopt some of the other

less spoilt terminological alternatives for the wider mentioning relation. Another reason for confining "refer" to the more restricted relation is that in this way one preserves the standard contrast between sense and reference which is important in two factor theories of meaning. So we shall say that "a" has a reference only where a exists;[1] otherwise "a" is about, signifies, or designates, a, though a need not exist or be appropriately shorn down to have only transparent features. The point of the distinction is to allow for the fact that to use "a" as a proper subject of a true statement is not necessarily to use it to refer (in the *philosophers*' sense). The distinction is important because it is precisely the identification of aboutness and reference that leads to the Reference Theory, according to which all proper use of subject expressions in true or false statements is referential use, use to refer, and thus according to which truth and falsity can be entirely accounted for, semantically, in terms of reference to entities in the actual world. That is, the only factor which determines truth is reference: at bottom the truth of "af" is determined by the reference of the subject expression "a" having the relevant property specified by "f". In contrast the distinction allows for the correct use of a subject in a true statement, as about an object, which is not use to refer and which can be made in the absence of reference, e.g. where the item does not exist.

The Reference Theory has often been characterised as the view that the meaning of a word is its reference or bearer, or that all genuine uses of words are to refer. What we shall take as our starting point however is a more prevalent, and plausible, special case of this view, namely that the meaning or interpretation of a subject expression in truth-valued discourse is its referent. The reason for so restricting what is meant by "the Reference Theory" is that liberal characterisations of the theory have encouraged the belief that the Reference Theory has been escaped once the extreme view that such syncategorematic expressions as connectives must refer has been abandoned, or once the Descriptive Thesis – that is, that all discourse can be reduced to truth-valued discourse – has been rejected. Non-descriptive discourse provides clear prima facie examples of uses of expressions which are not referring ones, and it has been supposed that rejection of the Descriptive Thesis is sufficient to guarantee that the fallacy, that all genuine use is use to refer, is avoided. But abandoning just the Descriptive Thesis is not enough, because the

[1] The formal theory is developed in Slog, chapter 3. Observe that occasionally quote marks are used as quotation functions, much as Russell uses them in OD.

Reference Theory is not adequate even as an account of meaning or truth in truth-valued discourse.[1]

Nor is the Reference Theory adequately characterised as the belief that the meaning of a word is its reference or bearer. First, such a characterisation is too psychological, and gives no clear logical criterion for when the Reference Theory is being assumed. Second, such characterisation is too liberal: the formulation of the Reference Theory must be restricted to subject terms and names, and not applied to all connectives and predicate components. Otherwise, the reference theorist is a straw-man; scarcely anyone (before modern semantical analysis in terms of functions) held the doctrine that the meaning of a connective like "but" is some entity it refers to, certainly not such prime targets as Augustine or Mill. Adequately characterised the Reference Theory is a much less simple-minded, and more pervasive doctrine. *The* (simple) *Reference Theory is* better *characterised by the rejection, in one way or another, of all discourse which* (whose truth and meaning) *cannot be explained on the hypothesis that the meaning or interpretation of a subject term is its reference*, that is of all discourse, where use is made of subject terms other than to refer.

The Reference Theory (RT for short) is often presented as a theory of meaning rather than of truth, as the theory that the meaning of an expression is its reference or – a more sophisticated version – that the meaning of a subject expression is given by, or is a function of, its reference. The connection between these two versions of the RT comes about through the connection between meaning and truth in truth-valued discourse (as explained, for example, by Davidson and by Hintikka; see Davis, Hockney and Wilson 1969). The connection is that the meaning of "a" is a function of (is given by) the true statements in which it occurs as subject, its use in true statements; but if the truth of such statements is a function of "a" 's reference, "a" 's meaning will also be just a function of its reference. The converse is obvious, because if the meaning of "a" is thus determined by "a" 's reference, the truth of statements about a will always be determined just by reference. What usually contrasts with both these versions of the Reference Theory are second factor theories of meaning and truth which assume that these features are not

[1] Thus we go substantially beyond the position that the work of Wittgenstein and of Austin has suggested to many, that the Reference Theory is not adequate as an account of meaning because it is not adequate to explain the meanings of terms in non-descriptive discourse and in discourse that is not truth-valued, to the much stronger claim that the Reference Theory is far from adequate as an account of meaning in descriptive truth-valued discourse.

just a function of reference but that there is a second factor which can determine truth along with reference.

According to the Reference Theory, as it applies to truth-valued discourse, all truth (and falsity) can be accounted for just in terms of the attributes of referents of subject expressions; succinctly, *truth is a function of reference*. In discounting entirely the legitimacy of using a subject in other than referring ways to determine the truth of some statements it is forced to reject all discourse which does not comply with its restrictions.

What is meant by the "rejection" of such discourse by the Reference Theory? The naive Reference Theory begins with the factual thesis that all discourse conforms to the referential structure it describes. Because no failure to observe it is envisaged, there is no question of classifying violations of referential structure. As this position cannot be maintained for long in the face of the many counterexamples, the theory is variously reformulated to classify these violations, in order to provide a rationale for their rejection. Different strains of the Reference Theory result according to how such classifications are made. Violations are variously rejected as unutterable or literally impossible (the naive position), unintelligible, meaningless, lacking in precise meaning, false, truthvalueless, illogical, unscientific, or simply not worth bothering about. Of these variants the rejection as meaningless has been singled out by opponents of what is sometimes called "the Reference Theory" for derision, as the Reference Theory of Meaning – because a term without a reference must be without a meaning, on the theory, so that any compound in which it occurs is meaningless. But it is the whole reference picture that is wrong and not just the particular version of it which sees conformity with the picture as necessary for meaningfulness. Since the picture as a whole is mistaken, differences among the rejections are comparatively unimportant; and it suffices to consider the weakest of these positions, which rejects violations as not truths which need be encompassed in any logical theory. For logical purposes, this reduces to not being true.

Because there are two aspects to reference – having a reference, with its correlate, existence, and having one and the same reference, with its correlate, identity – there are correspondingly two types of truth-valued discourse rejected, in some style or other, by the Reference Theory, first that where the subject expression lacks reference altogether, second that where the predicate is referentially opaque. The first of these, which involves

the rejection as false, or worse, of all discourse where the subject does not exist, amounts to the Ontological Assumption. It is clear why true statements about nonentities must be eliminated under the Reference Theory; because subject terms lack reference where the objects they are about do not exist, the truth of true statements about nonentities could not be determined just by reference. Hence too the not uncommon corollaries of the Ontological Assumption, that, since in the absence of reference there is nothing to determine truth, one can say whatever one fancies about nonentities. If on the other hand, truth is not merely a function of reference but of some other factor as well, there would be no need to automatically reject – and no such case for rejecting – such discourse simply because reference is absent. The Ontological Assumption is then a major component of the Reference Theory.

The second important component of the Reference Theory is the rejection or elimination of referentially opaque predicates and of discourse in which they appear, that is of statements which attribute distinct properties to (referentially) identical entities. Since on the Reference Theory, "a" and "b" have one and the same reference i ff$a$ and b are identical, this component amounts to the Indiscernibility of Identicals Assumption (the IIA). For to conclude from the identity of reference between "a" and "b" that there is exactly the same class of true statements about a and b is already to have assumed that reference is the only factor which determines truth. For it is only if reference is the sole determinant of truth that sameness of reference of "a" and "b" can guarantee that the same class of true statements hold of a and b. To reject the Reference Theory then one would need to restrict the Indiscernibility Assumption and its consequence that all "genuine" properties are referentially transparent, that is, are properties of the referent.

Many of the *unsatisfactory and restrictive features of the classical logical analysis of discourse derive from the Reference Theory.* Because of the Ontological Assumption the quantifiers and descriptors tolerated by the Reference Theory must be existentially loaded, that is the objects over which the variables and quantifiers range (in the usual referential sense of "range") must exist, and the domains of quantification must be domains of entities. For in standard logics where Universal Instantiation is valid, counterexamples to the Ontological Assumption could be generated if there were in the domain of quantification items which did not exist. By instantiating a principle which holds universally, a corresponding property would be ascribed to such a non-existent item, contradicting the Ontological Assumption.

Because of the Indiscernibility Assumption, sentence connectives allowed by the Reference Theory are effectively restricted to extensional connectives, that is to connectives which have the same truth-value when a component is replaced by another component with the same truth-value. For if intensional connectives were permitted contexts could be devised using connectives in combination with predicates to violate the Indiscernibility Assumption. For example, if the intensional connective "necessarily" is admitted it is easy to construct opaque predicates such as "is necessarily identical with Aristotle". Similarly because of the Indiscernibility Assumption the quantifiers permitted must be transparent, they must "range over" referents, so that substitution of expressions having the same reference (so-called "substitution of identicals") does not affect truth-value assignments. The joint requirements on quantifiers of existential-loading and transparency are especially clear in the reading for quantifiers that Quine proposes (WO, pp. 162–3), where the universal quantifier "(x)" is read effectively as "everything *is* (=) an *entity* x such that". A sufficient condition, in fact for a slab of discourse to be referential is that it be *adequately* expressible in the canonical notation of Quine's interpretation of quantificational logic with identity (as given, e.g. in WO).

The Reference Theory has a great many indirect or disguised forms and manifestations, many of which are more plausible or at least less clearly falsifiable than the original. Thus *the Reference Theory is* often *employed* at a level prior to formalisation *to determine "logical form" or "deep structure"*. Modern grammatical analysis (at least in its mainline form) preserves the Reference Theory by requiring that sentences in deep structure meet referential requirements and by employing an identity of reference test as a criterion of ambiguity to separate offapparent counterexamples. In much the same way classical logical analysis of discourse protects the referential assumptions of classical logic from direct falsification by requiring that sentences be transformed to consist of subject-predicate forms combined by connectives and quantifiers, where the subjects designate entities, the predicates are transparent, the connectives are extensional, and the quantifiers are transparent and existential. A sentence meeting these requirements is in canonical form, or Quinese (the canonical language of WO). Thus the Reference Theory dictates, through canonical form, what discourse classical logic attempts to deal with. For example, where canonical form is used to determine the genuineness of a property, the Reference Theory is being used as a criterion of the admissibility of predicates. Thus it is claimed, for instance, that intensional predicates cannot provide "genuine" properties

because they are referentially opaque, whereas a "genuine" property must be true of its subject however that subject is described. But such a criterion for genuineness of property would be correct only if descriptions merely having the same reference have precisely the same function, and could be used interchangeably for one another, that is the criterion would be correct only if the sole legitimate function of a description is to refer – in short, if the Reference Theory is correct. In a parallel way the Reference Theory is applied to determine, prior to formalisation, the "real" or "logical" subject of a statement, what the statement is "really about": this is done by way of existence and identity tests which ensure that real subjects are used referentially. For example, if an apparent subject does not refer to an entity, it cannot be the "real" subject. "Real" or "proper" subjects, like "genuine" properties, are those which accord with the Reference Theory.

Thus too *the Reference Theory is employed semantically to determine basic semantical notions* and to ensure that semantical notions conform, i.e. are properly behaved and intelligible. Given the basic – neutral – account of truth (derived in Slog, section 3.7), according to which the statement that xf is true iffwhat " x" is about, i.e. the individual (or item) x, has property f, a referential account of any one of these operative notions will carry over to the others. Hence there are three points at which the RT can be infiltrated into semantics, with the notions of truth, property or individual. The use of a referential account of *individual* is basic to the RT. The RT takes the subjects of discourse or individuals to be references; for given the RT, since truth is a function of reference, and the truths about an individual determine it, the individual can be nothing but a reference. This is also equivalent to taking the aboutness relation to be a reference relation, which as we noticed was a source of the RT. When the individual or subject of discourse is conceived in this way, as the sum of its reference-determined properties, i.e. as a reference, the notion of an individual which does not exist but which has some properties, is unintelligible. If on the other hand the individual has, like Meinong's object, properties which are not determined by reference, then it cannot merely be a reference. Hence it is possible to reject the notion that the individual is just a reference, the sum of its reference-determined properties, and to allow it to be a synthesis of these properties (if it has them) and further properties which are not reference determined, e.g. intensional properties, without abandoning the basic truth schema. Adoption of the basic truth schema, then, need not commit us to the RT unless we import referential assumptions into our accounts of *individual*, *property* or *aboutness* (subjecthood).

But classical semantics does adopt such reference-based accounts of these notions. Hence not only classical logic but also the classical semantics delineated by Tarski and others is derived from, and hence conforms to the Reference Theory. And according to classical semantics, meaning can be completely explained in terms of, and semantics exhaustively done in terms of, just the two related notions of reference and truth (or satisfaction) in the actual empirical situation. Although classical semantics is a covert way of enforcing the unquestioned requirements of the Reference Theory, it is widely regarded as providing, not just a semantics for *classical* logic, but a general semantical framework for *all* intelligible logical systems. Thus explanability in terms of a semantics which meets referential requirements becomes a condition of adequacy for a theory, as in the work of modern empiricists (e.g. Davidson). When the Reference Theory is used in this way as a condition of adequacy and to determine the problems, it is not only unfalsifiable, its rejection becomes almost unthinkable. Hence also a further disguised form of the Reference Theory: it is employed as *a criterion of adequacy on satisfactory solutions of problems* (often generated by the theory itself), e.g. such problems as quantifying in, mass terms, predicate modification, and so on.

The Reference Theory influences and shapes not only logical theory but other parts of philosophy, in particular epistemology. For *an epistemological correlate of the Reference Theory is empiricism*. Briefly the connections (which are spelt out more fully subsequently) are these. According to the Reference Theory the basis or origin of truth is always reference. What correlates epistemologically with the origin of truth is how we come to know it. Thus how we come to know truth, to knowledge, is always by reference, from entities and their transparent properties. But these we have access to ultimately only by sense-experience. Hence all knowledge derives ultimately from sense-experience, which is the main thesis of empiricism. In undermining the Reference Theory one accordingly undermines, at the same time, empiricism.

Although the assumptions of the Reference Theory now seems to most philosophers, particularly those brought up in a thoroughgoing empiricist climate, to be simply philosophical commonsense, it is clear enough that the systematic set of assumptions amounts to a theory, even if a very basic and general – and mostly unquestioned – one, about language and truth. Like any theory it must meet the test of accounting for the data, and this it fails to do.

The Reference Theory – although basic to and enshrined in classical logic and semantics, and incorporated in much modern linguistic theory and most modern philosophy of language – is wrong. It is not wrong, however, in the simple straightforward way that is sometimes imagined. Firstly, although exaggerated characterisation may have made it appear so, the Reference Theory is neither internally inconsistent or ludicrous. For a not unimportant fragment of discourse is referential and for that fragment the Reference Theory can provide a coherent account of such notions as object and truth.[1] Secondly, there is a large repertoire of devices for extending the range of the Reference Theory to encompass matters that would, perhaps, at first sight, seem beyond its scope. Thus if what can be expressed in the initially given canonical forms of the Reference Theory seems excessively restricted, an array of devices, still conforming with the Reference Theory, is available for extending the effective class of canonical forms. Foremost among these are theories of descriptions, set-theoretical reductions, and levels of language theories.[2] A great deal of enterprise and ingenuity has been spent – not entirely wasted – on trying to fit parts of non-referential discourse that are thought to matter into the Reference Theory; witness, in particular, the variety of paraphrases of (limited parts of) intensional discourse that have been proposed with the object of maintaining Leibnitz identity assumptions. Nevertheless despite all the auxiliary equipment for extending its range, the Reference Theory is wrong, for much the usual reason, that it cannot account adequately for the data. There are many true statements of natural language whose truth cannot be reconciled with the Reference Theory and the standard ways of attempting to reconcile them with the Reference Theory involve unacceptable distortion (as will be argued in detail). These include both statements about nonentities and intensional statements; and they serve to falsify both the OA and the IIA. To reject such cases on the grounds that they do not comply with the Reference Theory or its logical reflection, classical logic and classical semantics, is to make that theory prescriptive and unfalsifiable. Similarly saving the Reference Theory at the cost of saying that the theory of meaning and truth embodied in natural discourse is mistaken is like claiming that the world embodies a mistaken theory of physics. The test for correctness of a theory of meaning and truth

[1] Thus for limited purposes classical logic can be adopted, and it can be included as a restricted sublogic of whatever alternative logic repudiation of the RT forces one to.

[2] Many of these strategies for extending the RT are criticised in subsequent sections. There are of course parallel strategies designed to encompass knowledge which is not empirically derived within empiricism, and so also strategies to reduce concepts not of an empiricist cast to constructs from empirically-admissible components.

is its ability to give an adequate explanation of meaning and truth in natural language; any theory of meaning and truth which depends on dismissing or distorting as many important and ineliminable features of natural language as the Reference Theory does, must be mistaken, and should be superseded.

To accommodate, in the superseding theory, both sorts of uses of subjects, referential and nonreferential, and to make the differences explicit, the procedure already adopted (in §3), of explicitly removing (contextual) referential assumptions from example sentences, is extended. Henceforth subjects both in example sentences and in symbolic expressions are assumed *not* to occur referentially, unless referential loading is specifically shown or specifically stated or contextually indicated. The case where subjects do occur referentially can be represented symbolically by superscripting such subjects with symbol "R". So, for example, Hobbes' inference

I^R walk; therefore I exist

is admissible; but the inference fails if the premise is replaced by the unsubscripted premise "I walk". Similarly the inference

I^R exist; therefore RR exists

is admissible, since the contingent I = RR is built into the premiss. But the inference

Necessarily I exist; therefore necessarily RR exists

is not, since extensional identities are not generally replaceable in intensional contexts (contra Vendler 1976; the point is elaborated later).

With this procedure the extrapolation (already begun in the existential case) from natural language, which sometimes is referential, continues. In the interests of theoretical organisation and explanation, and a uniform logical theory, a shift is made to a natural extension of workaday language where referential assumptions are dropped in all sentence contexts unless explicitly indicated by superscripting or by the context of use. The theoretical point can be put in this way: though in surface linguistic structures both referential and nonreferential discourse occur, in deeper analysis only nonreferential forms are admitted and associated referential assumptions appear explicitly. In particular, then, *deeper structure is not referential*; and accordingly the logic of deeper structures of natural language is not classical. It cannot be pretended that the procedure for detecting referential usage in ordinary discourse and transforming it to nonreferential usage is so far anything

like an effective one. But then neither is the procedure, on which the first procedure can be made to depend, for symbolically transcribing natural language arguments and sentences. Given that referentialness of usage in symbolic transcription is *stated*, rather than implied by or in the context, superscripting can then be eliminated in favour of specific statement of referential requirements by way, as a very first approximation, of logical equivalences such as:

$$x^{\mathrm{R}}f \equiv .\ xf\ \&\ xE\ \&\ (y)(x = y \supset .\ yf).$$

But, as remarked, referential use in natural language appears not be stated but rather indicated or implied by the context of the expression.[1] The fact that underlying use is nonreferential is not a limiting factor in what can be expressed. Features of referential use can be stated or contextually exhibited.

In a historical search for a new theory to supersede the Reference Theory, there is no better place to begin than with Meinong's work. For Meinong's theory of objects represents the most thoroughgoing rejection of the Reference Theory that has so far been seen, surpassing even that of Reid 1895 and the later Wittgenstein 1953. In rejecting the Ontological Assumption Meinong was rejecting the major and characteristic thesis of the Reference Theory. But he did not stop there. He also cut through important ramifications of the Reference Theory such as the restriction of quantification (and correspondingly other logical operations) to referential modes of use, the rejection of intensional properties as genuine properties, and most importantly, the identification of the object (and proper subject) of a true statement with reference. Much of Meinong's theory can be viewed as an attempt to develop a phenomenological theory of the use of subjects in nonreferential discourse, which does not depend on reducing this discourse or equating it with referential discourse, or, what is equivalent, equating the subjects of such discourse with references.

If the accounts given of the real character of the Reference Theory and of the leading features of Meinong's theory of objects are anywhere near the mark, then there is no justice in attributing the Reference Theory to Meinong. Yet according to a criticism, apparently originating with Ryle (in 1933–34; also in 1971, p. 353 and p. 360ff; and in 1972) and now part of conventional Oxford wisdom, Meinong's theory is an extreme

[1] Where context is taken into account in the semantical evaluation referentialness of use can be supplied as a component of context; as to how, see Slog, 7.2. §8.

application of the naive "Fido"-Fido theory of meaning (FT), generally identified with the Reference Theory. Thus it is claimed that Meinong assumed the FT in assuming that to every meaningful subject "a" some object corresponds. According to Ryle this commits Meinong to the

> full-fledged doctrine that to every significant grammatical subject there must correspond an appropriate *denotation* in the way in which Fido answers to the name "Fido" (Ryle 1971, pp. 360–361).

As so explained by Ryle the FT seems just to amount to a version of the RT; but perhaps we can better characterise what Ryle intends by the FT as the doctrine that any subject "a" has a denotation if it has a meaning and this denotation a determines the meaning of "a". But once specified in this way it is plain that the FT and the notion of denotation particularly partake of the same ambiguity as the notions of reference and the notion of object, and on the basis of this ambiguity one can construct a dilemma for this criticism.

For either "a" is taken to refer to entity a and denotation is taken as reference, or, "a" is taken to be *about* a and denotation is not identified with reference or object a with reference a. Under the first alternative the FT is indeed the RT; for it takes meaning to be a total function of reference; but, as we have explained, there is no ground at all for attributing such a view to Meinong. It is quite incorrect to assume, as Ryle does, that in general for Meinong object a answers to "a" in the way that the entity Fido answers to the name "Fido". There is of course more than *one* way in which Fido answers to the name "Fido", and only one of them is a reference-relation. Another is the aboutness relation, the general relation between "a" and a. But since Ryle clearly takes "the" relation to be of the former variety, he has made the incorrect assumption that the objects of Meinong's theory are references and that the relation of denotation between "a" and a must be, and is for Meinong, a reference relation. Ryle, in assuming that all these relations must inevitably be referential, has proceeded to make assumptions drawn from the very theory he is denigrating, the RT, and then to use these assumptions in redescribing Meinong's theory, despite the fact that Meinong rejected them. Not surprisingly it is then a simple matter to "convict" Meinong of ridiculous and extravagant versions of the RT, and to represent Meinong as, for example, "the supreme *entity*-multiplier in the history of philosophy" (Ryle 1933–34, our italics). The inability of critics of Meinong who employ this sort of technique (e.g. Russell 1905, Carnap MN, Ryle, Bergmann 1967 and Grossmann 1974), to see how logical relations such as that between "a" and a, and quantification, could

be other referential relations, how objects could be other than entities, is itself sufficient indication of the grip of the RT.

To take the other horn of the dilemma, once the aboutness relation between "a" and a is distinguished from reference it is possible to construct a version of the FT which can be correctly attributed to Meinong, but there is no longer anything objectionable about such a doctrine, and it does not imply the RT. For once these notions are freed of referential assumptions the "naive" theory becomes – since an object a is described by the subject uses of "a" in true statements – rather the assumption (U) that for every meaningful subject "a" there are (nonquotational) uses of "a" as the proper subject of true statements and that these uses which are about a determine the meaning of "a".[1] This is simply an innocuous and neutral use theory of meaning, and one can only move from such a theory to the Reference Theory by assuming that all use of proper subjects is use to refer, which of course amounts to the Reference Theory itself.

Thus Ryle, in attempting to convict Meinong of holding the FT formulation of the RT, actually succeeds in completely inverting the true state-of-affairs; for not only does he accuse Meinong of accepting a theory of which Meinong is a main opponent, but he champions Russell (in Ryle 1971, pp. 361–5) as one who escaped the pitfalls of Meinong's stone-age theory of meaning. But in fact it is Russell who is committed to the RT, both for truth and for meaning (as Russell 1905 reveals). The truth version of the RT is an immediate consequence of the OA and the IA, both of which are important ingredients of Russell's theory (vide PM); and the meaning version is derivable from the truth version, given the connection between meaning and truth, e.g. as expressed in principle (U), or obtained thus: the meaning of subject expression "a" is a function of truths about a, which in turn are functions of the reference of "a", so meaning is a total function of reference. From these RT principles follows the damaging FT, that a proper subject "a" has a meaning only if it has a reference and that this reference determines the meaning.

Ryle argues, however, that Russell escapes the damaging FT because his distinction between apparent subjects and proper subjects enables him to allow a meaning to the former in the absence of reference. But apparent subjects only obtain a meaning and a use in true statements in a quite secondary, indeed a second-class, way, *via* their elimination in favour of subjects which do have references. Hence the thesis that meaning is a

[1] For the corresponding formal theory, see Slog, chapter 3, a theory further developed in MTD.

function of reference is not abandoned at all in Russell's theory: the distinction between apparent and proper subjects is merely used to enlarge the class of statements which can be "analysed" as having referential subjects (cf. too the modern referential programs, e.g. those of Quine FLP and Davidson 1968–69). Neither Russell's theory nor its subsequent elaborations and variations, despite their appearance of greater liberality, escape the Reference Theory; for nonreferential uses only manage to squeeze in, where they do, by being eliminated or reduced, and very roughly at that, in favour of referential uses.

The effect of abandoning the Reference Theory (and its elaborations) is one of logical liberation, and thereby (as we will come to see) of substantial philosophical liberation. Why then has it persisted?[1] Its persistence can be explained by a complex combination of circumstances (to be elaborated somewhat in what follows): Firstly, its linkage with empiricist-verification theses (whether in individualist or class form).[2] Secondly, connected with the first, the linkage (already explained) with classical logic and semantics. Thirdly, its initial simplicity, and its extendibility. Fourthly, because there is a correct theory, a denotational-type theory of meaning, closely allied to the Reference Theory which tends to reinforce it (see SMM and MTD). And how can the persistence of the Reference Theory be annulled? Not easily: many of those caught in the grip of the Reference Theory fail to see how there could be any alternative to it, how truth, and meaning, could be explained otherwise than in terms of reference. But the inadequacies of the Reference Theory have already pointed in the direction of an escape from the Theory, initially through elaborations (embroidery, so to speak) of the Theory itself, through Double and Multiple Reference Theories, but eventually in ways that break free of persisting referential assumptions altogether.

§7. Second factor alternatives to the Reference Theory and their transcendence.

In contrast to the Reference Theory, the theory of items rejects the thesis that meaning is a function of reference, recognizing (at least) a second independent mode of use of subject-expressions which is different from referential use and not reducible to it.[3] Given

[1] And why, for many, does remaining liberated require constant vigilance against the insinuation of the Theory in one way or another, e.g. through calls for analyses and reductions within its terms?

[2] These connections are traced in chapter 9 [reprinted in Vol. 3 —*Eds.*].

[3] Meinong can (on a very generous construal) be taken as reaching for *such* a two factor theory in his distinction between *Sein* and *Sosein*, that is between "x"'s having a reference and x's having a property;

such a "two factor theory" the possession of properties in the absence of reference or referential identity can be readily explained, if we assume, unlike Frege, that the second factor can operate to determine truth in the *absence* of reference, not merely in addition to it. On this account the two different factors yield two different ways of determining truth about the *same* object; they provide two important but different ways, a referential and a nonreferential way, of using the same subject. Theories which allow for two different forms of use, forms which can be construed as use and reference factors, can allow for such ways. By contrast the Fregean sense-reference approach still sees just the one way, the referential way, of determining truth, but it sees truths as truths about two different sorts of entities, and sees the second component, sense, as simply providing an auxiliary reference for oblique contexts. Thus the Fregean theory is effectively a Double Reference Theory (DRT) with the concept or sense providing a supplementary reference, but the mechanism is still that of reference. What is right about the DRT is the realisation that a further factor is needed to account for nonreferential uses of subjects. Its mistake is to assume that because an explanation of the truth of such statements must involve a second factor, the statements must refer to this factor. That is, the Double Reference Theory, still in the grip of the Reference Theory, replaces the problematic reference by another entity, the concept associated with it, and then treats the new associated subject as occurring referentially.

It is not difficult to trace a route by which someone, dissatisfied with some of the results and limitations of RT, but perhaps still in the grip of its basic referential assumptions, would arrive at an extended reference theory with further meaning factors entering. Granted, it may be said, that the Reference Theory works (only) for a fragment of discourse, why not try to build on what we have – which is not insubstantial, including an extensive and well-developed logical theory – by introducing a second factor in meaning, which may *also* determine (or help determine) truth? Then if we add the truths determined by this second component to those determined by reference, we might get a complete

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this distinction clearly allows a second mode of use of "x", as proper subject of a true statement, which is not, and not reducible to, use to refer. This is not the only distinction from Meinong's theory which bears some resemblance to distinctions of two factor theories. For example, Findlay notes (1963, p. 184), what seems pretty doubtful,

> that Meinong's distinction between the auxiliary and ultimate object does much the same work as Frege's distinction between *Sinn* (Sense) and *Bedeutung* (Reference).

picture of truth and meaning. In this way we can keep the Reference Theory as a correct account for referential discourse, but extend it, by adding a further ingredient of meaning, to encompass remaining truths and to solve paradoxes of intensionality. For example, if we introduce a second factor, say sense (or use), which is such that two expressions may differ in sense while having the same reference, we have at least the beginning of a solution to the problem of referentially opaque properties, as Frege saw in the case of the morning star-evening star paradox (see Frege 1892). With such properties, it is the sense of the subject expression, and not the reference, which determines the truth of the attribution, and hence the property need not apply equally to expressions which simply have the same reference. Similarly, if we were to conceive of this second factor as able to operate *in the absence* of reference, the fact of true statements about items which do not exist, whose descriptions lack a reference, is no longer incomprehensible.

Although such a second factor theory appears to contain the ingredients for a solution, there are, as we have noticed, distinct ways of developing it. One line, the line noneism takes, sees the two different factors as yielding two different ways of determining truths about *the same* item; the other, and the main line of development, still sees only the one way, the referential way, of determining truths, but sees these as truths about two different sorts of entities. The basic mechanism for determining truth remains one of reference,[1] and the second component simply provides a further, emergency, reference, which the subject-expression is taken as referring to where the simple Reference Theory will not work. The extension of the simple Reference Theory is obtained by taking cases where the attribution is determined by the sense of the subject expression as cases where the subject expression *refers*, not to the expected reference, but to the emergency reference, the concept. The basic mechanism is still referential, because once the new references, the concepts, are introduced, every subject again occurs referentially in its context. The main line account is *essentially referential*: the OA is satisfied, since all concepts are (said to) exist,[2] and apparent counterexamples to full identity replacement are (so it is said) removed. For example, once we have noticed that in nonreferential contexts "the morning star" refers to the concept Morning Star and "the evening star"

[1] Reference remains dominant on the Fregean account; for sense contains (almost consists of) the mode of presentation of the reference. It is an easy step to replacing sense by the reference presented together with the mode of presentation (whatever that is).

[2] Mysteriously: for where do they exist, and how; and what distinguishes them, and are they identical? The DRT concentrates intensionality in strange entities and then refers to these.

refers to the concept Evening Star, the apparent referential opacity of "The Babylonians believed that the morning star differs from the evening star" is eliminated. For the identity we should need to show that the context is opaque (namely that the concept Morning Star is identical with the concept Evening Star) now fails. In fact the conditions for identity of concepts are such that all sentence contexts (bar quotational ones) are rendered transparent once the emergency reference is substituted. Similarly once we have replaced statements about Pegasus by statements about the concept Pegasus, apparent exceptions to the Ontological Assumption, such as "Pegasus is a winged horse, but doesn't exist" are eliminated, since concepts are taken to exist. The Double Reference Theory is thus able to keep the characteristic tenets of the Reference Theory, the Ontological Assumption and the Identity Assumption, and at the same time apparently obtain the desired extension to express nonreferential discourse. But the Double Reference Theory can keep the reference mechanism while having the advantage of the different identity and existence conditions needed to obtain the desired extension of the theory, only because these different identity and existence conditions are provided by replacing, where required, the ordinary subjects by the new ones. Thus the replacement of the ordinary references by emergency references is essential to the Double Reference Theory. But it is just this replacement, and the result that the nonreferential properties which raised problems do not then hold of the *same* items as referential properties hold of, which is the downfall of the Double Reference Theory.

Firstly, the proposed emergency referents, denoting concepts, do not always have the right properties to replace the original nonreferentially occurring subjects. If, in the first case to consider, the replacement amounts to replacing the original subject "a" by the emergency subject "the concept of a", while leaving the original predicate unchanged, the difficulties are obvious. It might be true that Pegasus is a winged horse, but it is obviously not true that the concept of Pegasus is winged. Schliemann searched for Troy, not the concept of Troy, which he scarcely had to go to Turkey to find. For the replacement to work, not merely the original subject term, but also the original predicate, must be transformed.

But new difficulties arise when the predicate is replaced. Although in the case of a necessary truth about a nonentity an obvious transformation of the predicate suggests itself, e.g. "The concept Horse includes the concept Winged Horse" for "A winged horse is a horse", there is no such obvious substitute predicate in the case of awkward intensional

properties. What *is* the relation between Schliemann and the concept of Troy, which holds of this concept when and only when Schliemann searches for Troy? There is no obvious candidate. How can we guarantee that there *is* such a relation, and that it does indeed hold of the concept of Troy, without circularly specifying it as one that holds when and only when the original statement that Schliemann searched for Troy is true? Since the intention was to eliminate, and explain the truth of, "Schliemann searched for Troy" by reference to this other relation between Schliemann and the concept of Troy, we cannot make the specification of this new relation depend crucially upon the original. Yet it seems impossible, otherwise, to say what the new relation is. But if the new statement depends upon the original for its very specification, it cannot *explain* this original, much less eliminate it.

A second difficulty for the Double Reference Theory caused by replacement is that once replacement is made, referential and nonreferential properties no longer hold of the same item. First, this appears quite contrary to the facts of the matter. We can use the same expression referentially and nonreferentially in the one sentence where there is no case for saying it is ambiguous, e.g. in saying that Arthur is both a communist and believed to be a communist, or a known communist. That "Arthur" is not ambiguous is shown by the fact that we can quantify to obtain "Someone is such that he is a communist and believed to be a communist". Indeed it seems an important feature of such properties that they *do* both hold of the one item, for this explains their relevance to one another. Secondly, no matter how close the relation is between Arthur and the concept of Arthur (a closeness which it is up to the Double Reference Theory to demonstrate), if intensional properties are not really properties of Arthur, Arthur himself is still basically unknowable, unperceivable, not thinkable about, in short, noumenal. The replacement produces a generalised version of the difficulties faced by indirect and representational theories of perception.

A third group of di ffi culties emerges from iteration features, iteration of intensional functors and corresponding iteration of senses and references. For example, on Frege's theory, expressions in an oblique context have not only an oblique reference (identified with the ordinary sense) but also an oblique sense, which Frege differentiates from the ordinary sense. But what is the oblique sense like? The matter is left obscure in Frege. Worse, the differentiation leads to "an infinite number of entities of new and unfamiliar kinds" (Carnap MN, p. 130; elaborated in Linsky 1967, pp. 44ff). For the oblique sense

is equated with a second-degree oblique reference, which is associated with a second-degree oblique sense, which ... (for details see Linsky p. 32ff). Furthermore, such a multiplication of entities is required, on Frege's theory, to account for sense and reference in sentences with multiple obliqueness caused by iteration of intensional functors[1] (as, e.g. in the sentence "$\sim N(J(\Diamond(Hs)))$", "it is not necessary that John believes that it is possible that Scott is human" discussed by Carnap, MN, p. 131). These multiplication problems, though a consequence of Frege's theory, are not however an objection to all Double Reference Theories. For alternative theories can be designed which equate ordinary and oblique senses. To these theories there are other objections.

In fact many of the objections made generalise to apply against all theories in the Fregean mode, that is to say all theories which

(i) distinguish two, or more, classes of sentence context, e.g. extensional-intensional, ordinary-oblique, customary-indirect;

(ii) claim that in the "non-ordinary" contexts subjects do not (really) have their usual references but different *references*, with the result that the subjects function as if they had been replaced by new subjects.[2] The result of the subject replacement of (ii) is that

(iii) predicate expressions in "non-ordinary" contexts have also to be understood differently, and so, to put it syntactically, predicates have also to be replaced, i.e. "non-ordinary" contexts are completely paraphrased. Thus in non-ordinary context $f(a)$, not only is "a" replaced by "a^*", but "f" is also replaced by "f^*". For it hardly suffices, for example, to replace "Pegasus" in the sentence "Pegasus does not exist" by the "concept of Pegasus" or some set-theoretical construction (e.g. the ordered pair $\langle \Lambda, m(p) \rangle$ read, liberally; the null set in the guise, or mode of presentation, of Pegasus[3]), since, of course, the theories take their constructions, concepts or sets, to exist – otherwise what point

[1] Even so, the multiplication does not account at all adequately for the logic of intensional discourse; see the discussion of the insensitivity problem below.

[2] Thus Carnap's theory of extension and intension is not a theory in the Fregean mode, because "every expression has always the same extension and the same intension, independent of context" (MN, p. 133). Even so, Carnap's theory is open to *several* of the objections lodged against theories in the Fregean mode.

[3] A theory of this type has been advanced by H. Burdick(I am relying on an oral presentation of some of this theory). The basic idea is that in intensional contexts subject "a" is replaced by an ordered pair $\langle a, m(a) \rangle$ with $m(a)$ the mode of presentation (contextually supplied) of a in case a exists, and $\langle \Lambda, m(\imath x\ a\text{-izes}(x)) \rangle$ where a does not exist. The pair $\langle a, m \rangle$ is read – though without too much warrant – "a qua m" or "a in the guise of m" or "a in mode m". The modes, which like the new predicates do

the exercise has would vanish! So "does not exist" has also to be paraphrased, e.g. in the easy case given to "does not apply". But mostly the paraphrases of intensional functors, especially in the case of set-theoretic constructions, have to go well beyond the resources of English.

With this much of the structure of these Multiple Reference theories (i.e. theories in the Fregean mode) exposed, the objections can be restated. They are:

(1) *The distinction problem*, that is the problem of distinguishing ordinary, or extensional, sentence contexts from others. Making the distinction in a satisfactorily sharp way is a difficult matter, not or not merely because of borderline cases but because a solid non-circular basis for the distinction is hard to locate (as is explained in Slog, 7.13). In these empiricist times when distinctions are being demolished rather than forged. e.g. analytic-synthetic, descriptive-evaluative, when a certain holism is Wholesome, it is surprising that the extensional-intensional distinction, which causes similar problems to those of the synthetic-analytic distinction, has survived comparatively unscathed. In fact both sets of distinctions can be made out satisfactorily semantically, in a wider framework however than either empiricism or Fregean modes will admit (for main details of the distinctions, see Slog, MTD, and infra). The distinction problem is then a problem for theories in the Fregean mode, for essentially referential theories.

(2) *The iteration problem.* Intensional functors (non-ordinary contexts) can be nested, one inside the other. Thus single replacement will not, in general, suffice; a whole procession of new subjects and new predicates to cope with iteration is needed (as Carnap has explained, in MN, in the case of the Fregean theory). The iteration problem can be somewhat alleviated – though not eliminated, as it reappears elsewhere, e.g. in issues as to replacement and as to what is meant by complex modes of presentation – by exploiting iterable set-theoretic constructions in place of Fregean concepts. For example, on the ordered pair theory, the claim that Augustus believes that he believes that he believes that Pegasus is winged, ordinarily symbolised $B_aB_aB_aW(p)$, can be represented in the fashion $B1^*_aB2^*_aB3^*_a\langle\Lambda, m(p)\rangle$ with the single uniform subject $\langle\Lambda, m(p)\rangle$. The penalty is that the theory cannot acknowledge the different replacement conditions in different in-

not seem to get much of the explanation their use requires – are represented by further predicates (or on a variant of the theory by properties). Such a particular theory is subject not only to the general objections, but also to objections specific to it, e.g. to the Burdick theory there are variants of Church's translation objection, and on the theory various implausible exportation principles emerge as logical truths.

tensional contexts, which Frege's theory does at least acknowledge even if it cannot take due account of them. Thus intensional logic, including modal logic, is entirely destroyed. Even such implications as that from $\Diamond(A \,\&\, B)$ to $\Diamond(B \,\&\, A)$, which should be automatic, are lost. But this is in part to anticipate the next objection,

(3) *The insensitivity problem.* The logical equivalences warranting replacement or interchange in intensional functors are different for different sorts of functors. For example, for modal functors (such as possibility, $\Diamond$) replacement of strict equivalents is legitimate, but such replacement is not legitimate in entailment functors or in functors of the order of belief (see RLR); and replacement of coentailing statements which is admissible in entailmental functors is not admissible in belief functors. Theories in the Fregean mode are insensitive to these important logical differences. For "a" is replaced by "a^*" always in (connected) intensional functors and the replacement conditions for a^* cannot vary depending on its sentence context, as a^* is a referent subject to Leibnitzian conditions. Thus the equivalence conditions for concepts, for example, should be those of the most highly intensional functors (otherwise truth will not be preserved under replacement) with the result that legitimate replacements in less highly intensional functors are prohibited. The consequence is that *theories in the Fregean mode are inadequate to the logic of the intensional.*

(4) *The compounding problem.* Sentences with the same subjects, whose subjects are differently replaced in the theories, may be combined by sentential connectives, and operations applied to the subjects, e.g. some replaced by pronouns, quantification carried out, etc. For example, from the extensional-intensional compound

a is 60 but b thinks a is 50 $\qquad\qquad (a)$

transformations yield

a is 60 but b thinks he is 50, and

Of someone it is true that he is 60 but b thinks he is 50.

Such legitimate transformations theories in the Fregean mode are bound to prohibit. For (a) is replaced by

a is 60 but b (thinks 50)* a^* $\qquad\qquad (a^*)$

in which subject uniformity, required for the operations, is lost. Therewith too the relation of the parts expressed in

a is 60 but thought by b to be 50,

is sacrificed.

For similar reasons the theories of definition and analysis are thrown into confusion. What, for instance, is the reference of "a" in $\nabla T(f(a))$, where contingent truth is defined $\nabla TA =_{\mathrm{Df}} A \ \& \sim\Box A$? On analyses in the Fregean mode, "a" must have both direct and oblique references (e.g. both a and $\langle a, m(f)\rangle$). In the same way sentences like "Scott happens to be human" and "Babel erroneously believes that A" are, despite appearances, seriously ambiguous, with many terms having both direct and oblique references (cf. Carnap MN, p. 132). It is evident too that disambiguating such sentences will lead to a rather unsatisfactory (and repulsive) atomism: with theories in the Fregean mode we are back on the royal road to ideal languages.

(5) *The explanation problem.* The new predicates (and sometimes subjects) introduced are, for the most part, only intelligible in terms of those they are intended to replace, and really have to be defined in terms of them if truth and other values are to be preserved. Yet for the theories to succeed quite independent – yet unforthcoming, and unsuppliable – explanations of the new predicates, explanations which are in no way parasitic on ordinary intensional discourse, are essential.

(6) Such theories are *unnecessary*. For the discourse they aim to replace, or analyse, is in order and intelligible as it is. It is only commitment to a mistaken, an essentially referential, view that has made it seem otherwise. Once the referential identity assumptions, incorporated in Leibnitz's law, are given up, the need to make replacements in referentially opaque contexts is removed; and once the Ontological Assumption is abandoned, the need to analyse negative existentials along concept lines is removed. As a matter of history, it appears to be commitment to Leibnitz identity (referentially justified at that) that forced Frege to his sense-reference theory in resolving intensional paradoxes. For consider how his argument (in Frege 1892) breaks down without full replacement. Suppose, for a presumed reductio, identity is a relation between referents. Then, if $a = b$ is true, "$a = b$" should mean the same as "$a = a$". For, if $a = b$ is true, then "a" and "b" are just two names for *one* and the *same* referent, and "$a = b$" can tell us no more than "$a = a$". However this interpretation of identity statements must be false, because statements of the form "$a = b$" are sometimes highly informative whereas "$a = a$" is never such. The approach to identity replacement in the argument is, prima facie, inconsistent;

for two inferences of the form: $a = b$, $D(a) \rightarrow D(b)$ are permitted, a first with *means the same* and a second, justifying the first, with *can tell us no more*, but a third with *is highly informative* is prohibited. However if the third fails so does the second, and the first; if "$a = b$" is informative and "$a = a$" is not then "$a = b$" tells us more than "$a = a$". Thus too the fact that "$a = b$" does not guarantee that "$a = b$" tells us no more than "$a = a$": Leibnitz replacement fails. Only the assumption that identity is a relation between *referents* restores Leibnitz – a restoration that lasts only so long as referents are not replaced by objects. For we can simply say that identity is a relation between objects *without* commitment to Leibnitz replacement, and accordingly *without* ensnarement in intensional paradoxes such as that of Frege's argument. Then $a = b$ states an identity between objects a and b, and we can say, if we like, that "a" and "b" are both in fact about the one object a, i.e. b. But it is in no way permissible to proceed from this to: $a = b$ says no more than $a = a$, or the like, without further, unwarranted, referential assumptions.

Double Reference theories such as Frege's are then essentially ways of trying to save Leibnitz's law (cf. Linsky 1967, p. 24). But the "law" does not need, or merit, saving. Yet without such assumptions of the Reference Theory theories in the Fregean mode are otiose.

(7) Such theories are *inadequate* to the data; they are open to counterexamples. Consider again the examples countering the Ontological Assumption, e.g. examples with intensionality incorporated in the subject, as "The mountain RR is thinking about is golden". Either the subject is replaced or it is not. If it is not, referential canons of the theories are violated, since the mountain in question does not exist (and without the referential canons the theories are unnecessary: see point (6)). But the subject can hardly be replaced, for the frame "is golden" is extensional (and the null set, whatever its disguise, is not golden). Similarly other examples which counter theories of descriptions confound theories in the Fregean mode. Consider e.g. the statement that Meinong believed that the round square is round though nonexistent. Either the replacement object exists or it does not. If it does not then the theory is already noneist (in part) anyway and no such analysis is called for; while if it does then the analysis is inadequate, *unless* the predicate is also changed. Indeed the predicate will have to be replaced along with "the round square", because Meinong did not hold corresponding beliefs of (the round square)* which exists. Yet what evidence is there that Meinong had an attitude, B^* say,

to (the round square)*? Precisely none – unless the whole thing is simply a translation into obscurese of what the theories were supposed to be analysing.

A special set of countercases arise from the treatment Fregean style theories accord to nonreferring descriptions, which are taken to refer to some sort of "null entity". Certainly improved Double Reference Theories avoid the obvious objections to the simplistic strategy of having all nonreferring subjects refer to the one entity, e.g. the null class, by (erroneously) having them each designate something different, e.g. "a" designates $\langle \Lambda, m(a) \rangle$ instead of Λ, so the designation of nonentity "a" differs from the designation of nonentity "b". But, firstly, why say this? If the Reference Theory is abandoned, if sets do not exist, why not just say the obvious: "a" designates a, as Meinong says? Why start replacing "a" outside quotes by set-theoretical extravagances? Secondly, there are counterexamples to the improved treatments developing from counter-cases to the simplistic theory. One of the many places where these treatments run into trouble over the data concerns contingent (extensional) identities between nonentities, e.g. what I am thinking about = Pegasus. The statement is either contingently true or contingently false depending on what I am thinking about, but on Fregean theories it is necessarily true since the null entity necessarily equals the null entity. Were we permitted to make replacements on an ordered pair theory (e.g. on the grounds that the contingent identity is indirectly intensional because of one subject), the result would be even more curious. All contingent identities, whether true or not, with different predicates are rendered false because the null set in its different guises is never the same, i.e. $\langle \Lambda, m_1 \rangle \neq \langle \Lambda, m_2 \rangle$ where modes m_1 and m_2 are different because of different predicates. The null set is, in short, far from perfectly disguised on all occasions on this bizarre theory, which tries to replicate every nonentity by the null set disguised according to the description of the nonentity.

A not uncommon response is to dismiss such counterexamples as Don't Cares. This has the advantage, no doubt, of making the theories *unfalsifiable*: they work, like the Reference Theory, where they work. But too many of the places where they don't work matter philosophically.

Comprehensiveness of theory *can* however be obtained by going back on the basic distinction (of (i)) between classes of sentences, such as extensional and intensional. Thereby also, by making the theory pure, several of the other objections to theories in the Fregean mode are avoided, indeed it is only in this way that they can be escaped.

The resulting pure theory is not Fregean; for according to Frege 1892, when "words are used in their ordinary way, what we intend to speak of is their reference". But according to pure theory – and this is only its first less than plausible feature – we always speak of concepts; syntactically replacement is made uniformly in *all* contexts *including* ordinary or extensional ones. Such a total replacement program is bound to succeed – in one sense. For all it offers is a homomorphic mapping, preserving truth values; e.g. where $*$ is the mapping, $f(a_1, \ldots, a_n)$, translates to $f^*(a_1^*, \ldots, a_n^*)$, etc. But such a theory, though "pure", is rather trivial, and is largely uninformative: it has almost no explanatory power worth having.[1] Moreover what is the point of translating out referential uses, which are not (supposed to be) in question?

What is right about the Double Reference Theory is the realisation that something like a second factor is valuable in accounting for the logic of nonreferential contexts. Its mistake is to assume that because an explanation of the truth of such statements may involve appeal to a second factor, the statements themselves must *refer to* this factor. The Double Reference Theory, still in the grip of the Reference Theory, replaces the problematic subject by the concept associated with it, and then treats this new subject as occurring referentially. But what the replacement difficulties show is that statements where the second factor is relevant to truth are not generally statements *about* this second factor.

In contrast, in the alternative line of development of second factor theories, to sense and reference correspond respectively different (irreducible) ways in which one and the same subject term can be used, a referential way and nonreferential ways. To each way of occurring corresponds different identity and existence requirements – and, from one (but unfortunate) angle, different logics. Where a subject term occurs referentially what it is about must exist and it can be replaced by any term having the same reference; but where it occurs nonreferentially, it need have no reference, and can only in general be replaced by another term having the same sense. Thus the replacement difficulties which faced the Double Reference Theory are avoided (because there is no change of subject), while having distinct identity criteria and eliminating existence suppositions for nonreferential occurrence enables the alternative logical theory to cope with nonreferential discourse, which was the aim of the Double Reference Theory. For example, intensional and exten-

[1] Less trivially, and differently, a Fregean universal semantics for languages may be supplied: but it is unnecessary when there are better and simpler non-Fregean semantics.

sional properties do not become both referential properties of different items, but remain *different sorts of properties of the same item*. Thus intensional and extensional properties can be attributed to one and the same item without the relevant differences between the attributions being ignored. This is an essential preliminary to the adoption – as a special case of an adequate theory of intensionality – of the commonsense view of the objects of perception according to which it is the same item that both has ordinary properties like redness and roundness and may also have quite different perceptual properties such as being perceived to be red or round (i.e. Real Realism, as explained in chapter 8 [reprinted in Vol. 3 *—Eds.*]).

Many of the features of the alternative outlined are incorporated in Carnap's extension-intension method, but by no means all. For the replacement conditions for Carnap's intensions[1] are strict equivalence ones, but strict equivalents are not interchangeable in nonmodal intensional contexts, e.g. within the scope of perception functors, such as those of perceiving, seeing, smelling, etc. The second factor will have to differ then in its replacement conditions from Carnap's intension, the replacement conditions will have in fact to be like those for sameness of sense (and permit full replacement in nonquotational contexts).

The alternative second – or, more accurately, multiple – factor resembles a *use* theory; it is not a replacement theory like the Double Reference Theory, because the distinction turns not, as with sense and reference, on replacing problematic subjects by different subjects, but on how the same subject expression is used – referentially or nonreferentially. But don't these different uses really amount to assuming different subjects? Isn't the apparent sameness only obtained by using the same subject ambiguously, to cover both the entity and the concept? No, one and the same item can be used in different ways; for instance a knife can be used both as a cutting utensil and as a weapon. It doesn't follow that different knives are involved, nor would it be correct to conclude that a statement attributing both sorts of properties to a knife must be ambiguous. Similarly, as the knife model shows, it is wrong to conclude that because there are different uses of a subject there must be different subjects. The only reason for insisting that different uses do lead to different subjects and to different entities is the assumption that the only way of using an expression is somehow to refer; for then the difference in the way subject expressions can occur in intensional and extensional contexts can only be explained on

[1] References but for the fact that modal identity conditions prevail.

the supposition that the subjects are different. But there is no difficulty in supposing that both sorts of properties can be combined in the one item *once* we have dropped the referential conception of an object and its properties.

According to the Double Reference Theories, nonreferential use is reducible, at bottom, to a kind of referential use. But according to the alternative theories nonreferential use is irreducible, that is sentences containing nonreferential occurrences are not generally replaceable by sentences containing only referential occurrences, preserving truth-values. Hence the replacement difficulties encountered by Double Reference Theories are avoided.[1]

The distinctive feature of the alternative noneist theory is that one and the same expression may have both referential and nonreferential uses, although any one use will of course be either referential or nonreferential. Analogously one and the same item can have both referential and nonreferential properties, for example it may have empirical properties like being round and red and also intensional properties. So it is commonly in natural language. For example, the table can both be round and believed to be round. It is the same thing that is said to have both properties, and it is clearly quite wrong to say that the word "table" is used ambiguously in the sentence "The table is round and it is believed by Bill to be so", as various offshoots of the Reference Theory would have us say. What is correct is that the term "table" can function differently in different sentence contexts; for example, that different identity criteria apply for different occurrences.

But now the factors, which are too easily converted under referential pressures into further references – as happens with Carnap's theory in MN and with C. I. Lewis's theory – can be transcended, they can be stepped over and beyond. The second factor and further theoretical factors, sense, intension, comprehension, can be removed from the initial uniform picture of the logical behaviour of discourse that thereupon begins to emerge (these factors can, of course, be subsequently recovered definitionally, insofar as they are needed). Use of use, although an invaluable staging point in getting beyond the field of referential forces, is hardly satisfactory as a final stopping point.[2] For the end result, a use

[1] Similarly, nonreferential use cannot be eliminated in favour of talk about use, as referential but referring to sets of rules or the like.

Since nonreferential occurrence is primary, the *likely* direction of reduction is precisely the reverse, of referential discourse to nonreferential: the contextual constraints on this have however already been observed.

[2] On both these points see Wittgenstein, especially Wittgenstein 1953.

theory of meaning and truth – with use superseding the factors – is open to quite damaging objections,[1] *unless* the sort of "use" is more carefully circumscribed. But circumscribed it may be (in a theory of objects fashion) by restricting use to interpretative use, by taking use as a specific function, an interpretation. In the universal semantical theory for discourse[2] the application of the interpretation function I to a linguistic expression is always a function, a function which yields, at a given world and in a given context, an object, *not* a reference (for the object may be a nonentity, e.g. an individual or a function). In terms of this interpretation function, which gives the rule, or use, of every part of discourse, both truth and meaning can be defined (see MTD). Furthermore, a significant *synthesis of theories of meaning* can be achieved. First and foremost the theory is a use theory; for the meaning, or interpretation of an expression is a function and thus, in a precise way, a rule for the application of the expression in every situation and context. Secondly, the theory is, in a *wide* sense, a denotational-type theory, it provides by a general recipe an object as the meaning of each linguistic expression.[3] Thirdly, reference and sense, extension and intension, can be defined in terms of the theory, and the limits of their applicability established (cf. MTD). In a similar way other theories of meaning can be embraced, e.g. content accounts, contextual implication accounts, and so on.

What is basic in this approach (which only appears high-flying because not enough earthly detail has been given) is the explication of use by interpretation in semantical modellings, with interpretation conceived in noneist terms and not referentially restricted. This points the direction which the semantical elaboration of nonclassical logic can satisfactorily take. The use account also shows the way revision of logical theory should proceed.

Nonreferential use is a fact of ordinary discourse, a fact not adequately recognised in mainstream logics. In order to allow for nonreferential occurrences in logic an essential preliminary is the abandonment of those assumptions embodied in classical logic which stem from the Reference Theory, that is, those assumptions which force us to say

[1] For some objections, see Findlay 1961. But really many objections are quite conspicuous, e.g. the range of irrelevant uses linguistic expressions have, the problem in explaining how truth is explained through use, etc.

[2] Adumbrated in part IV [this volume, §15 ff. *—Eds.*]. For full details see US and MTD.

[3] As to how this theory, which can be a part of noneism, differs from, but relates to, the RT, see SMM, p. 197.

that there is only one way a subject expression can properly occur, a referential way. These assumptions include the Ontological Assumption, the Indiscernibility of Identicals Assumption, and derivative assumptions such as the assumption that everything exists. The dropping of these assumptions is however entirely preliminary to what is important and really required, the admission of nonreferential occurrence. To drop the basic and derivative assumptions of the Reference Theory is to leave *open* the possibility that the subject of a true statement may occur other than referentially. Though a necessary first step, this is a long way from implying that there are nonreferentially occurring subjects in true statements, and very far from providing any of the requisite features of their logical behaviour.

Two integrated stages lie ahead then: a stage of demolition of classical logical theory and its variations and elaborations, and emerging from this, a stage of renovation and rebuilding, of designating and constructing new logics and semantics which can account for nonreferential discourse.

III. The need for revision of classical logic

It is a corollary of the rejection of the Reference Theory that classical logic is seriously wrong, and, since a logic is still needed, in need of drastic revision. Briefly, since classical logic embodies the Reference Theory and the Reference Theory is false, classical logic is wrong. The same theses, of inadequacy and of the need for revision, can be argued for in a rather more independent fashion.

No part of classical (two-valued) logical theory escapes serious criticism under the theory of items eventually arrived at. Table 1 separates some parts of classical logical theory, and indicates the sorts of criticism made. Some of the criticism summarised in the table, especially that of quantification logic and of identity and description theory, is an integral part of the case for alternative logics in harmony with a theory of items, and accordingly merits more detailed presentation. In more ambitious undertakings – something the development of alternative nonclassical logics certainly warrants – all these criticisms and others would get elaboration. Many of the criticisms can of course already

be found in the literature: the overwhelming case for alternative logics is in large measure a matter of organising the scattered criticism into a coherent whole.[1]

§8. The inadequacy of classical quantification logic, and of free logic alternatives.

At least an existence-free reformulation of quantificational logic is needed if logic is to be, as it should be both nonplatonistic and independent of non-logical studies such as physics. For, according to classical logic, there exists an item which is either f or is not f; so there exists an item. But without either some version of platonism or physics no existent item is guaranteed. Both the thesis that logic presupposes some platonistic metaphysics and the thesis that logic presupposes certain contingent truths of physics are, however, open to telling objections. For example, *central* truths of logic should be prior to and independent of those of particular metaphysical theories; for, as they are applied in deducing consequences from and thereby assessing these theories, they should not depend for their correctness on these very theories. Again, the truths of *pure* logic are necessary truths, uncontaminated by contingency; hence they cannot – without commission of a modal fallacy – imply contingent truths or settle between various consistent physical theories. Logic should not depend on the state or permanence of the universe, or on the correctness of, say, Einstein–Minkowski space-time theory to ensure purely past and purely future individuals and events as values of individual variables; nor should it rest upon or arbitrate in favour of a platonic metaphysics. Thus some reformulation of logic, in which classical existence theorems such as $(\exists x)(xf \vee {\sim}xf)$ and $(\exists f)(\exists x)xf$ are eliminated, is essential.

This first trouble with classical quantificational logic, that it improperly involves nonlogical material assumptions, can be classically solved – if so inelegantly that the methods are rarely adopted in classical textbooks – by one or other of logics with empty domain. This does not go to the root of the trouble. The switch to a classical logic which allows for an empty domain does not permit theories – for instance, virtually *any* mathematical theory – to be restated nonplatonistically, without a heavy loading of

[1] The main criticisms I want to lodge, which are not included in the text, may be tracked down in the following sources:- sentential logic, detailed critique of classical logic and of irrelevant alternatives, RLR; quantificational logic, SE, EI, Slog; identity theory, EI, Slog; class and relation theory, and number theory UL, Slog, WN; metalinguistic theory, P, DLSM.

Table One

Part of Classical Logic [Place in PM where developed]	*Sorts of Criticism Made*
Sentential (or propositional) logic [*1 – *5]	(1) The rule γ of Material Detachment is not generally correct. (2) The logic fails to include essential connectives, such as satisfactory implicational and conditional connectives.
Quantificational logic [*9 – *11]	(1) The logic includes material assumptions such as that some things exist. (2) The logic does not include other than existentially-restricted quantifiers and subject terms, and accordingly fails to allow for the formalisation of much important discourse which is not, or not obviously, existentially committed.
Identity theory [*13]	Either the theory fails (as in PM2) entirely for intensional discourse, or (as in PM1) the theory includes no account of ordinary, extensional identity.
Description theory [*14]	(1) There are clear counterexamples to the theory. (2) The theory is incompatible with leading and independently defensible theses of the theory of objects.
Class and relation theory [*20ff.]	(1) The treatment of paradoxical items, and the resolutions of the paradoxes, are inadequate. (2) There is really no theory of properties or intensional relations. (3) Many unwarranted assumptions as to the existence of classes and relations are made.
Number theory [*50ff.]	(1) The reductions assign numbers many properties they do not have. (2) Platonism is incorporated and rendered a matter of logic.
Metalinguistic theory [post PM]	(1) The (referential) case for the theory does not bear thorough investigation. (2) The theory does not offer a satisfactory resolution of semantical paradoxes. (3) The theory would eliminate (and hence supply no logic for) much important discourse.

existential claims. For the switch does not enable anything much to be *said* about what does not exist.

The first trouble is symptomatic of larger, and serious, limitations of classical quantification logic, namely

(L1) the inability of the logic to express subject-predicate assertions, and truths, where the subject item does not exist, and

(L2) the limitation of quantifiers admitted to existentially-loaded ones, and the consequent inability of the logic to formalise quantificational claims about what does not exist.

Because of the limitations much important discourse, and some major philosophical theories, lie beyond the scope of classical expression. Also because of the limitations many philosophical problems are generated, (pseudo-) problems which vanish upon liberalising the logical framework. Overcoming the second limitation presupposes that the first limitation has been overcome; otherwise wider quantifiers have nothing to range over.

There are accordingly two main ways of reforming classical quantification theory, by *(existence) free logics* which remove limitation (L1) but not (L2), and, more radically, by *(ontologically) neutral logics* which eliminate both *(L1) and (L2)*. To elaborate the differences:- In free logics[1] classical ranges of bound variables are, in effect, taken over unchanged; thus individual bound variables have as designation-ranges just (individual) entities. In neutral logics on the other hand, ranges of bound variables are widened like those of free variables to admit at least some sort of nonentities as objectual values, and appropriately wider quantifiers are therefore introduced. The distinction free logics are obliged to make between free variables and bound variables is artificial, and also unwarranted, since we can and do talk perfectly well quantificationally about nonexistent objects. Certainly in free logics presuppositions of classical logic, such as that something necessarily exists, are eliminated; only in neutral logics, however, can one explicitly deny that something does not exist and talk freely, generally and particularly, about the wide variety of objects that do not exist. And really the whole dependence, in free logic as

[1] Splendidly promoted by K. Lambert, and his collaborators and students: see e.g., Lambert and van Fraassen 1972 and references cited therein, p. 178, p. 200ff. Lambert sometimes characterises "free logics" in a much more sweeping way which includes neutral logic as a free logic. But Lambert and van Fraassen 1972, p. 129 counts as "free logics" logics "that deal with singular terms in the way we do", i.e. without nonexistential quantifiers.

in classical logic, of how logic goes on or whether objects exist is deeply wrong: logical inference and implication are substantially independent of whether the objects they are about exist.

Free logic changes both the formalism and (therefore) the interpretation of classical quantification logic. Neutral logic changes the interpretation of quantification and accordingly can retain its formalism; but it augments the formalism in such a way as to include the correct insights and criticisms of free logic. The basic scheme of classical theory, on which derivation of the mistaken existential principles of the theory typically rely, and which both free and neutral logics fault, is the scheme of existential generalisation

(EG) $\quad af \supset (\exists x)xf,$

already criticised.[1] EG, a direct outcome of the Ontological Assumption, is open to a variety of prima facie counterexamples, such as these: Meinong's round square is believed by noneists to be round and square, but it is false that there exists an item which noneists believe to be round and square; phlogiston does not exist but it is impossible that there exists an item that does not exist; Cerberus is a three headed dog but there does not exist a three headed dog; the philosopher Aristotle is dead but it is false (we claim) that there exists a philosopher who is dead.[2] Classically the formalism is saved by restricting the interpretation of the symbolism: subject terms are required to be existentially-loaded, and typically – to save identity and existence requirements of the Reference Theory – predicates are also restricted to cut out intensional predicates and ontic-status predicates like "does not exist" and "is dead". But the saving saves too much, and supposes once again, what is false, that something *must* exist. And why make the "saving"? Surely we want also to be able to logically enshrine some of our reasoning about nonentities.

It is better by far then to amend the formalism to *show* the correct logical principles than to smuggle the proper restrictions into the interpretation. The correct replacement

[1] Equivalents such as universal (existential) instantiation

(∀I) $\quad (\forall x)A \supset \breve{S}^x_a A|$

are faulted at the same time.

[2] Similarly for many many other examples, e.g. the examples considered (though with the connected inference pattern $af \rightarrow (\exists x)(x = a)$ in view) in Lambert and van Fraassen 1972, p. 130: Zeus is not identical with Allah; The ancient Greeks worshipped Zeus; The accident was prevented; The predicted storm did not occur; True believers worship Beelzebub.

for EG is, as emphasized in the case for free logic, the scheme

(FEG) $\quad af \,\&\, aE \supset .\ (\exists x)xf$

where "aE" reads "a exists". For consider the counterexamples to EG: what is lacking in each case (which the Ontological Assumption is supposed to supply) is the assumption that a exists, and the fault is rectified by adding aE to the antecedent. It is the amendment of EG to FEG that is characteristic (but not definitive) of free quantification logic as developed by Lambert, and others; and in this way (existence) free logic avoids the existence assumptions of classical logic. Plainly free logic adds to classical logic[1] a predicate "E" taken at the pure quantification stage as primitive (given identity, E may be defined: $aE =_{\mathrm{Df}} (\exists x)(x = a)$. The remaining very distinctive thesis[2] of free logic, $(\forall x)xE$ (i.e. $\sim(\exists x)\sim xE$), every entity exists (i.e. no entity does not exist), fixes the intended interpretation of "E", as a universal predicate.

The reform of classical quantification logic thus accomplished by free logic, though important, is insufficiently radical. Worst, in free logics classical ranges of bound variables are taken over intact; it is because bound variables have as ranges just entities that the free logic thesis $(\forall x)xE$, read: Everything exists, and redolent of arch-referentialists such as Quine, is valid. Thus too free logics retain such notable consequences of the Reference Theory as that to exist is to be the value of a bound variable: the escape of free logics from the Reference Theory is only partial.

But if the ranges of constants and free variables can be widened to admit nonentities, why cannot the ranges of bound variables be similarly enlarged? Of course they can, and in the obvious, and (can we say) natural,[3] semantics for free quantification logic they are so enlarged. A *natural model* for free logic has, as well as the usual interpretation

[1] As well as an essential distinction between constants and free variables on the one side and bound variables on the other, else it collapses back into classical theory upon defining xE in terms of any tautology, e.g. as t.

[2] Free quantification logic differs from classical quantification logic, as formulated e.g. by Church 1956, only (after rewriting in reverse notation) in adding the primitive E, subject to the axiom $(\forall x)xE$ and in replacing scheme (∀I) by

(FAI) $\quad (\forall x)A \supset .\ aE \supset \breve{S}_a^x A|$

the equivalent of replacing EG by FEG. Hence FEG (or FAI) and $(\forall x)xE$ are, so to say, the distinctive theses of free logic.

[3] Cf. Lambert and van Fraassen 1972, p. 200:

function I, two domains, an inner domain ID over which bound variables range, and an outer domain OD, which includes ID, over which free variables range. The interpretation $I(a)$ of constant a is some element of OD, and the interpretation of n-place predicate f^n, $I(f^n)$, is an n-place relation on OD. Apart from the aforementioned features a model is defined as for classical quantification logic. In the absolute model (reflecting the true state of affairs) ID is the domain of entities and OD of objects. Now the ordinary explanation of central semantical notions, such as validity, requires quantification over the outer domains i.e. absolute quantification over all objects; for example the definition of, validity in a model begins: whatever elements of OD are assigned to constants, ... But if quantification over the outer domain is permissible in the semantical metalanguage of free logic, then it ought – if the logic contains adequate means of expression and is honest – to be permissible in the object language also. Various replies can be made to such objections, the most telling of which is that a semantics for free logic can be provided which makes use only of inner domains, and more generally that a semantics for free logic can be given which makes use essentially only of free logic (type of) resources. That such semantics can be given (and in more than one way) is true. The motivation usually given for such rather more contrived semantics and for the restriction of free logic quantifiers indicates however that free logic is intended to operate within the assumptions of the Reference Theory and really offers no adequate escape from them. With only an inner domain in the referential model $\underset{\sim}{M}$,

> not all constants need have a designation in the domain; some may be nonreferring terms. How can we find out whether "Pegasus flies" is true in $\underset{\sim}{M}$ if "Pegasus" does not designate anything in $\underset{\sim}{M}$? The answer to this question is: we can not find out. Since Pegasus does not exist, there are no facts to be discovered about him (Lambert and van Fraassen 1972, p. 180).

Similarly on the modelling Pegasus, in contrast to entities, has no properties and stands in no relations: the Ontological Assumption is bought, in almost unvarnished form. However (by artificially separating the truth of af from a's having the property of f-ness) sentences

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> To be sure some could develop a philosophical semantics for free logic that does recognise a realm of non-actual but possible beings. This, indeed, is the most natural (though not the only) way to interpret the "outer domain" semantics ... .

"Other ways" which can include an analogue of an outer domain are substitutional and truth valued semantics.

like "Pegasus flies" can be arbitrarily assigned by the model one of the truth values, true or false.

> What we can do is arbitrarily assign that sentence a value. Or we can say that due to its occurrence in some story ... the *name* "Pegasus" has acquired a certain connotation. Due to this connotation, we may feel "Pegasus swims" is false and "Pegasus flies", true. To get all the true sentences in the language, then, we need as part of a model $\underset{\sim}{M}$ also a *story*. This story has to be consistent with the facts in $\underset{\sim}{M}$, of course (Lambert and van Fraassen 1972, p. 180).

Then where some a_i does not refer (to an entity), $(a_1 \ldots a_i \ldots a_n)f^n$ is true in $\underset{\sim}{M}$ – it is not a *fact* in $\underset{\sim}{M}$ – i ff it belongs to the story$\underset{\sim}{S}$ of $\underset{\sim}{M}$. The main reason for not varying this compromise modelling – so that facts are determined by the story also, e.g. the fact "Lambert pioneered free logic" is true in $\underset{\sim}{M}$ because it is part of the (logical) story $\underset{\sim}{S}$, or, on the other hand, so that the story is determined by the facts about nonentities – is just to avoid a theory of objects, to retain a sharp division between entities and ..., to maintain "a robust sense of reality" (Lambert and van Fraassen 1972, p. 200):

> In our development (of the semantics), *talk* about nonexistent objects is just that – "talk" is what is stressed. "Non-existent" object, for us, is just a picturesque way of speaking devoid of any ontological commitment.

The truths concerning nonentities are just talk, parts of stories: there are no facts about nonentities. This, like the idea that if there were more than talk, facts, there would be ontological commitment to nonexistent objects, is a hangover from the Reference Theory. "Free logic", so interpreted, is not a liberated position congenial to the theses of the theory of items, but essentially an opposition position, a cooptive extension of classical logic designed to remove, in a different way from classical theories of descriptions, certain of the more conspicuous prima facie objections to the Reference Theory.

Even when more satisfactorily construed, with an outer domain of objects, free logic is no panacea. Very many of the problems classical logic generates transfer intact to free logic. Thus, for example, all the classical difficulties concerning quantification into intensional contexts are equally problems for free logics. Like classical theory too, free logic cannot accommodate mathematics as an existence-free discipline (indeed existence theses

appear in a very conspicuous form on the "free" account), and it cannot account, without implausible platonism or implausible reductions, for the ideal nonentities of theoretical science.

Neutral logic, by contrast, avoids these problems. Moreover neutral logics are richer than free logics and properly include them.[1] Neutral logics are much preferable to free logics not just because they are less poverty-stricken in their means of expression, and more comprehensive in theses, but also because they are much better equipped to accomplish the objectives already argued for in previous sections. For instance, free logics soon prove inadequate as foundations for intensional and chronological logics, because they prevent the formalisation and assessment of frequently-made claims about nonentities.[2] Indeed they are inadequate for the symbolisation of many sentences of natural language, e.g. sentences like the examples displayed towards the end of part I [this volume, §1, sentences (α)–(μ) *—Eds.*]. An adequate quantificational logic, which does enable proper formalisation of discourse and which removes classically generated problems, requires removal of limitation (L2) as well as (L1). Insofar as free logic makes one liberalisation but not the other it is an unsatisfactory halfway house on the way to an adequate theory. It is a halfway house, moreover, that is scarcely likely to make the transition to a fully liberated logic easier. For the motivation of free logic remains at fault: the idea that we can only talk quantificationally about what exists is an outcome of the Ontological Assumption. Yet if the Ontological Assumption should be rejected, when formulated with arbitrary constants, then it should be rejected generally, when formulated with variables or quantificationally.

§9. The choice of a neutral quantification logic, and its objectual interpretation.

Bringing the ranges of bound variables into line with those of free variables means introducing new quantifiers, quantifiers which are not existentially controlled as "$\forall$" and "$\exists$" are.

[1] For details see DS, and also SE.

[2] It can be confidently predicted too that the projects of modalising and intensionalising free logics, and combining the results with a satisfactory theory of descriptions, will encounter serious difficulties. And the evidence thus far is that they do (for the same reasons as in the classical case: see part IV [this volume, §15 ff. *—Eds.*]).

A tempting move has been to extend the derived ranges of both free and bound variables to include possibilia, and to introduce corresponding quantifiers "Π", read "for every possible", and "Σ", read "for some possible" (see, e.g. SE). The new scheme of generalisation – of possibilia logic

(◊G) $\quad af \supset (\Sigma x)xf$

enables many of the worst objections to EG to be escaped. Moreover free logic can be recovered as a special case on introducing the predicate "E" since

$$\begin{aligned} af \,\&\, aE &\supset (\Sigma x)(xf \,\&\, xE) \\ &\supset (\exists x)xf \end{aligned}$$

and since $(\forall x)xE$ reduced to the theorem $(\Pi x)(xE \supset xE)$ upon defining $\forall$ in terms of Π and E, or equivalently in terms of $\exists$ and $\sim$. Possibilia logics are more liberal than free logics; for example, though free logic enables one to assert that Pegasus does not exist it does not enable one to infer therefrom that something does not exist. Possibilia logics are decidably preferable to free logics for the reasons already given: namely, they are much less impoverished in their means of expression, more comprehensive in theses, and much better equipped to accomplish the objectives earlier outlined.

Despite their advantages possibilia logics do not go far enough; they reintroduce practically all the problems of classical logic concerning existence, only as problems concerning possibility. Thus the new scheme ◊G, though it escapes many counterexamples that vex EG, still faces a similar class of objections, represented by the following counterexamples: Meinong's round square (Mrs) is round and square but it is false that some possibilia is round and square; also it, Mrs, is impossible but no possible item is impossible; and Meinong believed his squound was squound but it is not true that for some possibilium Meinong believed that it was squound. Rather similarly the scheme can be corrected by a free logic strategy. In free possibilia logic ◊G is replaced by the properly Qualified scheme,

(F◊G) $\quad af \,\&\, a\Diamond \rightarrow (\Sigma x)xf,$

where "◊" reads "is possible". ◊G can of course be "saved" by restricting ranges of variables to possibilia; F◊G goes beyond this and liberalises the ranges of free variables but not of bound variables, so that impossibilia can be values of free but not of bound variables. This unhappy discrepancy between the roles of free and bound variables and, more generally, the anomalies of possibilia and free possibilia logics can be avoided by introducing wide neutral quantifiers which place *no* restrictions on the class of items introduced. Then the scheme – of neutral quantification logic

(PG) $\quad af \rightarrow (Px)xf,$

where "P" reads "for some (whether possible or impossible)", is correct *without* interpretational qualification.[1] No qualification of the antecedent is needed to avoid falsification of the implication or to permit detachment, thereby eliminating the problems that arose in the case of classical logic and to a lesser extent with possibilia logics, that, to put it another way, there is a class of items subjects may be about lying outside the scope of the logic.

There is indeed (as will become plain when objections are met) nothing to prevent a neutral reinterpretation of quantification logic. For the *formalism* of classical quantification logic on its own carries no commitment to the actual; it is the usual semantics and interpretations together with associated theories – descriptions and identity especially – that account for the referential character of the standard logic. The valid schemata of classical (referential) quantification logic continue to hold for neutral quantification logic when rewritten with "P" uniformly replacing "∃" and "U" uniformly replacing "∀". To this extent neutral quantification logic, as so far introduced, merely provides a reinterpretation of quantification logic – with the schemata rewritten to stress the new interpretation and to enable the derivation of the logical behaviour of the (original) referential quantifiers "∃" and "∀".

The intended interpretation of the neutral quantifiers is an *objectual* one, in the sense of "object" of the theory of objects. Specifically the semantical evaluation rules for the quantifiers take the following objectual form, relative to a given domain of objects:

[1] At once there is an, inessential, qualification to exclude absurdia in the main development that follows. As to how nonsignificant subjects may be included as well in the formal theory see Slog, chapter 7, where a beginning is also made on the vexed question as to whether such subjects are *about* objects.

> For a given assignment of objects to the free variables of wff A, the value of $(Ux)A$ is 1 iffthe value of A is 1 for every assignment of objects to x, and the value of $(Px)A$ is 1 iffthe value of A is 1 for some assignment of objects to x (cf. Church 1956, p. 175).

More concretely, $(Px)xf$ is true iff f is true of some object a in the range of subject variable x. In terms of the theory of objects such an objectual interpretation is a very material one, and it enables a number of fiddling objections to options to objectual interpretations of quantifiers, such as substitutional interpretations, to be simply evaded; for example, objections such as that there may not be enough names to match the range of objects, or that names are countable in number and objects not. It is sometimes assumed that a quantificational logic which admits talk of nonentities has to invoke a substitutional interpretation of quantifiers, i.e.

> The value of $(Ux)A$ is 1 iffthe value of $A(t/x)$ is 1 for every term t, and of $(Px)A$ is 1 iffthe value of $A(t/x)$ is 1 for some term t.

Such an assumption is made, for example, in Lambert and van Fraassen 1972, p. 217:

> Some things are impossible ... Name one. The round square .... It's totally impossible. [It is assumed] that a statement of the form "Somethings are ..." is true if some statement of the form "... is a ..." is true. This has sometimes been expressed as: whatever can be a subject of discourse has being. Today we refer to it as the *substitutional interpretation* of quantifier phrases.

But the initial dialogue is perfectly compatible with an objectual interpretation, and in no way depends on a substitutional construal. Nor need it involve at all the thoroughly mistaken thesis that whatever can be the subject of discourse has being ("is a" does not entail "is" without an Ontological Assumption added in).

While many of the objections to substitutional interpretations, formerly thought to destroy them except for limited purposes, certainly do not succeed (even the insufficiency of terms objection fails given, as the theory of objects permits uncountably many names), and while substitutional interpretations are often heuristically very useful, there are reasons for avoiding substitutional interpretations[1] and the like, e.g. truth-valued se-

[1] The usual substitutional interpretation has other drawbacks as well, e.g. it makes analytic, what is false, that everything has a name.

mantics and domainless semantics, at least to begin with (they can be recovered later, as DS and Slog indicate). Firstly, substitutional semantics are nominalistically inspired they represent but another attempt to replace objects by names for them – and they are quite unnecessary once the Reference Theory is rejected. Secondly, in one respect, they allow too much; for they enable quantification to take in parts of speech that are not subjects, e.g. even parentheses as placeholders for quantifiers. This is illegitimate for the same reasons that second order quantification of predicates is (see Slog, chapter 7). But thirdly, they offer insufficient analysis; for they fail to get inside structured sentences and offer analyses of their parts. For this reason they become rather contrived – if applicable at all – where internal sentence structure really matters, e.g. in theories of identity, descriptions, adverbial modifiers. For like reasons they do not enable a theory of meaning to be straightforwardly obtained from a theory of truth, since many parts of speech are not assigned an interpretation. Not even descriptions for subject terms are readily forthcoming; and if they were substitutional interpretations would again be otiose.

Though the truly objectual reinterpretation of quantification logic escapes these difficulties and has other advantages, it has some important side effects often thought damaging. In particular, the reference and individuation requirements commonly imposed on items in order to apply referential quantification logic can no longer be properly applied. There is, however, nothing to stop quantification over items that are not appropriately individuated and existent (i.e. not entities subject to referential identity) or over items that are not appropriately clear and distinct. Suppose the drunken Greasely seems to see a freckled duck, though the duck may not exist and may be indeterminate as to the number of freckles and to that extent not completely individuated; nevertheless PG holds, and it follows that for some a the drunken Greasely seems to see a, though it does not follow and is not true that there *exists* a (properly individuated or clear and distinct) x such that the drunken Greasely sees x. *Quantification requires* then *none of the conventionally assumed necessary conditions, existence, distinctness, countability* (as indeed reflection on the natural language uses of "every", "some", "many", etc., should have revealed long ago). Nor (contrary to the implicit assumptions of seventeenth century rationalists and of Kantians) must quantification be restricted to the possible.

For why stop short at possibility? There are many cases, especially in mathematics and intensional logic, where we need to talk, reason and argue about impossibilia just as much as possibilia. Many of the arguments and reasons for going on from existential

logic to possibility logic prove just as effective as arguments for not stopping at possibility. For example, impossibilia just as much as possibilia may be the objects of intensional attitudes and properties, e.g. one may have beliefs and opinions about and an interest in the round square just as one may in the perfect blue square. Hence since the logic of intensional discourse must take account of such functors it must admit impossibilia along with possibilia. Likewise, impossibilia may be the objects of logical argument, as when one argues that "Necessarily the round square does not exist, so necessarily *something* does not exist". Impossibilia, and quantifiers ranging over them, are essential if such arguments are to be faithfully reflectable in logic. The impossible situations called for in the semantical analysis of intensional logic and of entailment provide (as RLR explains) excellent working examples. For impossible situations – which are quantified over in the semantics – are but one sort of impossibilia. And so on, through variations on the prima facie reasons already presented for the Independence Thesis.

There are, to sum up, excellent reasons for proceeding to wide quantification, that is for logical change, so as to include within the scope of logic, reasoning about both possibilia and impossibilia. Though the uninterpreted formalism of quantification theory is satisfactory, the usual interpretations of quantification theory are not: this applies both to referential interpretations of the theory in terms of ranges of entities, and also to more recent *liberalisations* of the semantics which admit *possibilia* as designation-values of *variables*. But once the semantics is changed to admit talk of possibilia and impossibilia, quantification theory needs, it soon appears, supplementation, enrichment by further notation so that recognised features of nonentities such as indeterminacy and inconsistency can be dealt with logically.

§10. The consistency of neutral logic and the inconsistency objection to impossibilia, the extension of neutral logic by predicate negation and the resolution of apparent inconsistency, and the incompleteness objection to nonentities and partial indeterminacy.

A common reason for stopping at possibilia is the belief that we cannot talk consistently about impossibilities, hence they are "illogical".[1] But the belief is mistaken: semantical

[1] This is a belief I was briefly persuaded to share. The original script of SE was drafted in terms of neutral quantifiers which included in their range impossible objects, but subsequently the paper was

modellings (e.g. of relevant logics) show that we can talk consistently about what is impossible. In fact it already follows from the consistency of reinterpreted quantification

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rewritten with possibility-restricted quantifiers, for the reasons set out in SE, pp. 259–60. But the argument there outlined does not establish its point – without the importing of further assumptions (implicitly adopted) concerning the properties of impossibilia, properties supplied by (tacit but illicit) use of the Characterisation Postulate.

The argument of SE, p. 259, proceeds from consideration of Primecharlie, the first even prime greater than two, to the conclusion that, for some f, Primecharlie f and $\sim$Primecharlie f, violates the syntactical principle of noncontradiction of quantification logic. But the argument depends on the assumption that "Primecharlie is prime" and "Primecharlie is not prime" are either both true or else both false; and it may be broken at this point. For without further assumptions, e.g. from a theory of descriptions or from the CP, there is nothing to settle these truth values, and nothing to prevent the taking of one as true and the other (accordingly) as false. Such assignments we shall accept, realising full well that we may be storing up trouble for the future, at the post-quantificational level. The reason is this: A naive use of the CP would lead to the conclusions that Primecharlie *is* prime and that Primecharlie is an even number greater than two. But by neutral arithmetic (e.g. first-order Peano arithmetic, written with neutral quantifiers), for *no* even number n greater than two is n prime. Hence Primecharlie is not prime. There are, however, several options to investigate before the area is declared a disaster area unfit for logical habitation, and only one of these, the first, involves abandoning neutral quantification logic: (1) Neutral arithmetic is reformulated nonclassically with a paraconsistent quantificational base. In chapter 5 [reprinted in Vol. 2 *—Eds.*] we shall say that this sort of move is on its own not far-reaching enough. (2) a suitable sentence negation-predicate negation distinction is made. The basic line of argument is given in this section. (3) The CP is restricted, e.g. so that it does not tell us that Primecharlie is greater than natural number two. This approach is followed through in chapter 5 and subsequent chapters. In the end something from each option will be adopted.

Arguments that substitutional quantification cannot be extended – at least while a classical logic base is retained – to include all nonreferring terms fail for similar reasons; that additional, rejectable, assumptions have to be made for the argument to succeed. Consider, for example, Woods' argument (1977, pp. 665–66) that Haack's substitutional approach to the logic of nonexistence "does not work". The argument supposes, first, that for the term "Atherton" the statement that Atherton squared the circle, *a cl* for short, is true. Woods appeals to a fictional source for the truth (Atherton squared the circle in an obscure novel by Djaitch du Bloo), but the CP would serve as well or better (with Atherton as the man who squared the circle). Given *a cl* Woods' argument is brief:

> "Someone squared the circle" is not embarrassing because "Atherton squared the circle" is true. Existence may not be imputed, but self-contradiction is. And from a contradiction anything follows. If you are a classicist, that is (Woods 1977, p. 666).

Further assumptions are required, however, to show that self-contradiction is imputed. For if it were (by an S2 modal scheme distributing possibility), $\Diamond(a\ cl)$. But *a cl* is given as true so $\Diamond(a\ cl)$ again by S2 principles, and so classically it is not the case that $\sim\Diamond(a\ cl)$. In short, on the classical scheme of things with such substitutional quantification superimposed, self-contradiction is not – cannot be – imputed. The further story, given *a cl*, would perhaps be that *a* is an impossibilium, since it is certainly not possible that there exists, or even is possible, a person who does what Atherton does. Impossible objects can however perform impossible tasks. Such a claim makes it plain that once again there is further logical ado: the logic of entities cannot be transferred intact to the logic of nonentities, even if bits of it like quantificational logic (and perhaps the logic of identity and relations) can: For referentially "Someone squared the circle" would be taken to imply "The circle can be squared", which contradicts the textbook thesis that the circle cannot be squared. With nonreferential discourse some at least of the referential links have to be broken. Which – a matter we come to – is however a task beyond the quantificational stage (though it can reflect back on the quantificational logic).

logic that we can talk consistently in limited ways about impossibilia, just as it follows that we can talk consistently about possibilia – once we abandon the Ontological Assumption so that we are not troubled by such elementary arguments as that in speaking of what does not exist we are contradicting ourselves by saying that there exist things that do not exist. This refutes – it should be for once and all – the widespread idea that any theory of impossibilia is bound to be inconsistent; it is evident from neutral quantification that sufficiently weak theories of impossibilia are consistent.

However the consistency of limited quantificational ways of talking is insufficient assurance for fuller theories, especially since these limited means do not enable the reflection of important logical features of impossibilia or, for that matter, of possibilia and of entities. The point, yet to be developed, is that neutral quantification logic is not syntactically rich enough to provide the distinctions needed: reinterpreted quantificational logic stands in need of enrichment by further predicates and connectives to bring out recognised features of objects that do not exist.

Beyond the sheltered logical environment of reinterpreted quantification logic, neutral logics are far from uniquely determined. One important choice, for example, is as to whether certain alleged truth-value gaps are to be closed, and if they are more than apparent how they are to be closed; whether sentences like (1) and (2) which directly designate nonentities have truth-values, and if so whether they have truth-value true or truth-value false. At this stage semantical (and metaphysical) considerations do enter. For other value assignments for (1) and (2) can be consistently adopted[1] than those Meinong made, that is than those that have been defended as correct, and will be assumed in the major investigations that follow.

Once the theory *is* augmented, especially if by versions of the Characterisation Postulate, which yield truths like (1) and (2), the consistency problem tends to arise again, more acutely. It is probably the most common of the many allegedly fatal objections to any theory like Meinong's theory of objects that it is inconsistent, and therefore worthless, trivial, etc. It is of the utmost importance to observe, first of all, that the final inference made fails in general. Many inconsistent theories are not trivial (in the sense of

[1] Some features of the non-Meinongian neutral logics which result from different assignments are outlined below.

admitting everything),[1] and are far from worthless (see the argument of RLR, especially 1.7). A major option – not to be lightly dismissed, though the ideas involved run completely counter to the philosophical tenor of the times – is that a really satisfactory theory of objects will be a nontrivial inconsistent theory. But this is not really an historical option.[2] Even in the case of Meinong's theory the historical evidence is, when accumulated, rather decisively against the inconsistency interpretation; for example, Meinong rejected Russell's contention that the theory of objects was inconsistent (cf. Mög, and see the historical discussion in chapter 5 [reprinted in Vol. 2 *—Eds.*]).

It is likely to be argued, however, that quantification logic cannot be kept, that some classical laws of logic have to be modified, once impossible items such as Primecharlie (the first even prime greater than two) are properly admitted. For either "Primecharlie is not prime" and "Primecharlie is prime" are both true or they are both false. There is no rationale, so it is claimed for the two remaining possible assignments. Thus for some predicate f, (Primecharlie)f and $\sim$(Primecharlie)f. If both statements are true, in virtue of (allegedly assumptible) properties Primecharlie does possess, "is prime" provides a suitable predicate: if both are false, e.g. because Primecharlie does not exist, the predicate "It is false that ... is prime" suffices. Therefore for some predicate, the syntactical law of non-contradiction (*SLNC*) $(Ux)\sim(xf \ \& \ \sim xf)$ fails. Similarly the syntactical law of excluded middle (*SLEM*) $(Ux)(xf \vee \sim xf)$ fails. Since however these principles follow at once for neutral quantification logic, various classical laws of logic have to be restricted in scope. For instance SLNC holds at most for possibilia and entities, SLEM at most for entities and for other items in respects for which they are definite. So contrary to the assumptions of neutral logic, reinterpreted classical quantification logic does *not* hold for all nonentities.

Meinong's theory may appear especially vulnerable to this criticism. Since, where

[1] Such theories do not of course include quantificational theory in the usual sense in which the rules are unrestricted. For the inconsistency construal, the rules have to be regarded as systemic (i.e. applying only to theses of the system).

The interpretation of the theory of objects as an inconsistent theory will he considered in much detail subsequently, in particular in chapter 5 [reprinted in Vol. 2 *—Eds.*]. But it is important to follow through the consistency route, since this yields information and distinctions required for the inconsistency route as well.

[2] Perhaps Heraclitus was an exception? The Heraclitean fragments seem to leave the issue deliciously open.

Dialectical theories, on the other hand, were never theories of objects, but commonly linked with, what the theories of objects help to refute, idealism.

a is Meinong's round square, both "a is round" and "a is not round" are true according to Meinong's assignments (this follows from the truth of (1) and (2)). Thus SLNC apparently fails. Indeed any impossibilium will have *some* property for which SLNC is flouted. Nor is SLNC the only law to fail. Meinong at one stage argues that for certain non-characterising predicates f and $\sim f$ of a possibilium a it is false that a has these properties i.e. $\sim af \ \& \ \sim(\sim af)$. For example, since Kingfrance is not determined with respect to baldness both

(5) Kingfrance is bald, and

(6) Kingfrance is not bald

are false.[1] Under this assignment of truth-values, SLEM, $af \vee \sim af$, apparently fails.[2] In fact, given the usual relations between "&" and "$\vee$", apparent violation of SLEM follows directly from the apparent violation of SLNC (e.g. by (1) and (2)).

That classical laws of logic have to be qualified, that they no longer possess universal validity, and in particular that LNC no longer has universal validity, was Russell's chief objection to Meinong's theory of objects.[3] Meinong dismissed this objection[4] on the

[1] By contrast, the statement

(5′) The present bald king of France is bald,

is true when the context does not supply existential loading and false when it does supply such loading. For in the second case (5′) will imply, what is false, that the present bald king of France exists. It follows that the present bald king of France is a distinct possibilium from Kingfrance, since he has an extensional property, being bald, which Kingfrance does not.

[2] The assignment of falsity to both (5) and (6) does not violate the Independence Thesis; for the assignment is based, not on the non-existence of Kingfrance, but on the indeterminacy of Kingfrance in certain respects.

An alternative neutral theory under which both (5) and (6) are not truth-valued, with values true or false, because indeterminate or because Kingfrance does not exist, can be developed. But such a theory is liable to infringe the Independence Thesis. Moreover under any such theory a satisfactory treatment of beliefs, fears, wishes and so forth about possibilia is complicated. Since people believe propositions, propositions without truth values have to be introduced. And the proposition that a believes the proposition that p will be true or false even when p is not truth-valued.

[3] Russell 1905.

[4] A. Meinong *Über die Stellung der Gegenstandstheorie im System der Wissenschaften* (1907), p. 14 ff. Russell's rejoinder, in his review of Meinong's book in *Mind* vol. XVI (1907), p. 439, that LNC is asserted not of subjects, but of *propositions*, simply evades the issue. For Meinong was concerned with the well-known traditional formulation of LNC as: for any item (subject) and any property, it is not the case that the item both has and lacks that property. He was not repudiating the semantical thesis that no propositions are both true and false, or, to put it in his (non-equivalent) way, that no objectives both obtain and do not obtain. Indeed it is evident that Meinong adhered to a bivalence principle for objectives.

It was Russell, moreover, who was unhistorical: for in the traditional formulation, which had wide currency at the time Russell was writing, SLNC is asserted of subjects.

ground that no one would ever think of applying *these logical principles* to anything but the actual or at most to the actual and possible. He argued that exceptions to logical principles which are confined to impossibilia, or even to non-entities, are not important limitations of these principles. In addition the typical, and Aristotelian, applications of these logical principles, and standard defences of them, occur in settings where existential presuppositions *are* made, and where restrictions to entities are normally assumed.

Russell's own theory appears to lie open to similar objections. For, firstly his theory brings out both bald(Kingfrance) and not-bald(Kingfrance) as false, and hence apparently violates LEM. Secondly, his theory of classes apparently – before contextual conditions come into play – violates LNC (see Carnap's criticism in MN, pp. 147–9). And, in a way resembling the class theory, Russell's theory of descriptions can be so amended that LNC rather than LEM is apparently flouted; for example so that, neglecting scope, $(\imath x(xf))g$ iffthere exists a referentially unique f which is g or also there does not and every f is g (i.e., for the last clause, $(x)(xf \supset xg)$). The reformulation has the advantage that under it both (1) and (2) are true yet (5) and (6) remain false; thus it approximates the assignments of the theory of objects rather better than Russell's theory (the drawbacks of the *Reformulated Theory of Descriptions*, as it is henceforth called, are explained in chapter 4 [reprinted in Vol. 2 *—Eds.*]). Thus too it furnishes an elementary consistency proof for a non-negligible portion of the theory of objects. Indeed a theory containing versions of every one of the theses M1 through M7 (set out on p. 3) can be demonstrated consistent by elaborating this method.[1]

Russell would quickly point out that on his theories any violations of logical laws are only apparent – that when descriptions are eliminated through their contextual definitions apparent violations of LEM disappear. Meinong can, and does, make a somewhat similar reply to objections that his theory infringes fundamental logical laws.

The inconsistencies are only apparent. For the arguments used depend upon equating "a is not f" (e.g. "Primecharlie is not prime") with "It is not the case that a is f" ("It is not the case that Primecharlie is prime"), upon confusing negations of different scopes. The arguments presented in favour of abandoning such "negation" laws as SLNC and SLEM only hold provided that negations of significant sentences are taken to be of

[1] The methods has its limits. For consistency depends on the eliminability of descriptions and on not treating descriptions as full logical subjects. Without the latter inconsistency would quickly ensue from truths of the apparent form $(\imath x(xf \,\&\, {\sim}xf))f \,\&\, {\sim}(\imath x(xf \,\&\, {\sim}xf))f$.

just one sort: the sort represented in classical quantification logic. The arguments fail if we are prepared (following Meinong) to distinguish two sorts of negation, wider negation and narrower negation. Using wider negation SLEM holds without restriction. But with narrower, or *predicate*, negation LEM does not always hold. To illustrate: (5), symbolised "k bald", and (6), symbolised "k ∼bald", are false. But ∼(5), i.e. ∼(k bald), where "∼" represents here classical sentence negation, is true, since (5) is false. So though PLEM [i.e. predicate LEM $\_\_{}_{Eds.}$] – instantiated k bald ∨ k ∼bald – fails, SLEM – instantiated k bald ∨ ∼k bald – holds in virtue of truth-table assignments for sentence negation. Thus

(i) $\sim xf \vee xf$,

holds for all x, though

(ii) $x \sim f \vee xf$

does not. Similarly, because (5) is true but (6) is false

(iii) $\sim xf \rightarrow x \sim f$

does not hold generally.

Likewise though predicate LNC, PLNC, does not hold generally, SLNC is valid without qualification. To illustrate: the statement "It is not the case that Meinong's round square is round", symbolised "∼mrs round", is distinct from the statement "Meinong's round square is not round", which is symbolised "mrs ∼round". The statements are not even equivalent; for as (1) is true the first statement is false, whereas the second, (2), is true. So though ∼(mrs round & ∼mrs round) is true, the corresponding predicate form ∼(mrs round & mrs ∼round) is false. More generally, while

(iv) $\sim(\sim xf \,\&\, xf)$

holds for all x,

(v) $\sim(x \sim f \,\&\, xf)$

does not hold generally. Similarly because (2) is true but (1) is false, the converse of (iii)

(vi) $x \sim f \rightarrow \sim xf$

does not hold generally: it fails for some features of impossibilia.

Given the distinction between predicate and sentence (internal and external, or narrower and wider) negation, there is an ambiguity in such syntactical laws as LEM and

LNC between predicate and sentence forms. The principles which, according to Meinong, have a limited scope are the predicate laws; the sentence laws are, as Russell averred, not so restricted in application. The syntactical laws have in turn to be distinguished from such semantical principles as that every proposition is either true or false and no proposition is both true and false; in the consistent theory of objects such principles are not in dispute, (and the semantics subsequently adopted will vindicate them).

According to the consistent theory of objects, the traditional and widespread idea that impossible objects are quite beyond logical reach (that they violate the fundamental laws of logic, are not amenable to logical treatment, and hence cannot be proper subjects of logical investigation) depends upon the long-standing confusion between attributing inconsistent properties to an item (e.g. f and $\sim f$) and inconsistently attributing properties to it (e.g. saying it has f and that it is not the case that it has f). Only in the second case would impossibilia be beyond the scope of a consistent logic. It is now evident that this hoary confusion can be cleaned up by making an appropriate negation scope distinction.

Through his distinction, in the theory of incomplete objects, between wider and narrower negation, Meinong has thus provided the apparatus for a consistent logical treatment of impossibilia. Meinong explained this as the distinction between *Nichtsosein* or not-so-being, which may be taken as the presence of the opposite property, and *das Nichtsein eines Soseins* or the not-being-of-a-so-being, which may be explained as the absence of the property (Mög, pp. 171–4). Meinong makes the contrast in terms of the form "A has B" (or "A possesses B"). The contrast is between "A has non$B$" (*Nichtsosein*) and "It is not the case that A has B" (*das Nichtsein eines Soseins*).[α] The distinction transforms into modern logical form upon replacing "A" by "a", B by "f-ness", and using the equation: x has f-ness iff xf: then the contrast is precisely between $x{\sim}f$ and $\sim xf$. Given this negation scope distinction impossibilia can be admitted as full logical subjects, and the Characterisation Postulate can be applied to them without inconsistency to provide appropriate properties. Thus, for example, Meinong's round nonround is, by the CP, both round and nonround, and so has the properties of roundness and non-roundness; whence, particularly, some object, namely an impossible one, has the properties of roundness and nonroundness. The semantical law of noncontradiction,

[α] For clarity, we have inserted "A has non$B$" where Richard had: "A lacks B", i.e. "A does not have B". —*Eds.*

according to which no proposition is both true and false (or, what is equivalent under commonly made assumptions, that it is not the case that both xf and $\sim xf$), is not thereby violated, because internal negation does not imply wider or external negation; in particular that x is not round does not imply that it is not the case (or false) that x is round. And there is no inconsistency in Meinong's position because the law of noncontradiction (and similarly the law of excluded middle) holds generally only for external negation, not for internal negation (Stell, p. 14ff. Mög, p. 275).[1] According to Meinong, the object "something blue", for example, is undetermined in respect of extension, it is neither extended nor not extended, and the principle of excluded middle breaks down (at least for internal negation). But with the wider negation (*erweiterte Negation*) as in the truth "it is not the case that something blue is extended", the principle of excluded middle applies without restriction.

The admission of inconsistent objects to assumptibility inevitably raises, yet again, the charge that Meinong's theory, whatever its pretences to consistency, is irretrievably inconsistent. The usual support for the objection maybe generalised thus: where $L(y)$ is a law of logic for arbitrary y, the item x which violates L, i.e. $\imath x{\sim}L(x)$, yields a case of ${\sim}L(y)$, i.e. ${\sim}L(\imath x{\sim}L(x))$, and hence renders the theory inconsistent, since $L(\imath x{\sim}L(x))$. But of course, $\imath x{\sim}L(x)$ is not assumptible, i.e. the Characterisation Postulate does not apply. The idea that it does apply completely generally is a product of the uncritical transfer of the logic of entities to nonentities. But, as we have already glimpsed through the Reformulated Theory of Descriptions, there are ways of consistently elaborating Meinong's general theory of objects which do not give away any of its essential features, by qualifying the Characterisation Postulate appropriately. For example, on the consistent theory sentence negation cannot figure in the Postulate; for an item cannot determine of itself what it excludes.[2] There is clear textual evidence,[3] furthermore, that

[1] It is worth noting that a similar negation scope distinction and rule has recently proved fruitful in providing semantics for a class of non-modal intensional functors (see RLR; ABE, p. 48): the distinction is similarly expressed in natural language, as the distinction between describing an inconsistent situation (e.g. as one to which some proposition and its negation both belong), which is a perfectly consistent activity, and inconsistently describing a situation (e.g. as one to which some proposition both belongs and does not belong).

[2] This ties with the older intuition that an object cannot be defined negatively, and also with more modern ideas, from theories of orders that ${\sim}af$ does not, unlike af, determine a first-order feature of a (for appropriate f).

[3] See also chapter 5. The important matter of qualifications on the CP is much discussed in later chapters, especially chapter 5 [reprinted in Vol. 2 —*Eds.*].

Meinong did want to qualify the Characterisation Postulate; e.g. he wanted to exclude certain factuality and existence predicates from assumptibility (UA, pp. 70-l; Mög, p. 278 ff). However the qualifications Meinong would have imposed, which are entangled with the semantical doctrine of the modal moment, remain syntactically obscure, and may well have been noneffective. Since the abstraction axiom of set theory is, given an obvious definition of set abstracts – viz. $\hat{x}A(x) = \imath y(z)(z \in y \leftrightarrow A(z))$ – a special case of the unqualified CP, the problems of obtaining proper qualifications for the Characterisation Postulate are no less difficult than those of obtaining them for the abstraction axiom. Thus Meinong's failure to present clear effective qualifications can scarcely be regarded as detracting substantially from his achievement, any more than Cantor's failure to provide effective qualifications on the abstraction axiom detracted from his achievement in set theory; and it would be just as unreasonable to abandon the theory of objects on the ground that a naive version is inconsistent as it would to abandon set theory merely because naive versions are inconsistent.

Consistency of the unreduced[1] theory of objects turns on a distinction between negations (more accurately, on differences in negation locations). Logical empiricists have, however, argued (completely in character) against making a distinction between sentence and predicate negation. Russell, for one, claims that negation is always sentence negation (PLA, p. 212). But Russell's objection to predicate negation fails once it is conceded, as his own theory of descriptions lets us conclude, that there may be two ways of negating assertions; for then there is no objection to having "$\sim k$ bald" true and "k $\sim$bald" false. In effect two sorts of negation appear in Russell's work, distinguished by scope differences; consider, for instance, $\sim$(5), i.e. on the conflation (6). On Russell's theory of descriptions this disambiguates into the following two forms according as different scope of $\sim$ is taken, namely (in orthodox notation) $\sim[\imath x k(x)]b(\imath x k(x))$, which corresponds to $\sim$(5), and $[\imath x k(x)]\sim b(\imath x k(x))$, which corresponds to (6). Thus the very distinction the consistent theory of objects requires is already represented in PM, at least in the surface grammar. Consider too the distinction between "$\sim(\ldots = \ldots)$" and "$\neq$" in PM, *13.02. In other words, the distinction between sentence and predicate negation can alternatively be brought out by introducing scoping brackets, or by a scoping predicate. By using the predicate "T", read "it is true that", or less satisfactorily (in Prior's fashion) "it is truly

[1] The matter is different if the theory reduces, i.e. discourse about nonentities can be eliminated, in one way or another, in favour of discourse about entities, e.g. through a theory of descriptions or a bundle theory construing nonentities as sets of properties.

said that", one can distinguish "$\sim T$ mrs round" and "T $\sim$mrs round", corresponding to "$\sim$mrs round" and "mrs $\sim$round".

Use of "T" suggests widening the negation distinction so that predicate negation is replaced by a narrower negation which now however applies generally to sentences; and *then* use of scoping predicate "T" is just equivalent to introduction of narrow negation. There are advantages too in extending the negation distinction; for the notion of predicate negation tends to put too much weight on the specific syntactical form of sentences to which it applies, and in the case of sentences containing several connectives raises awkward questions as to whether the predicate negation is invariant under different selections of sentence subjects (in fact it seems to be). It is somewhat easier, both syntactically and semantically, to work with connectives which operate on sentences and not just on special sorts of sentences or parts of sentences. Accordingly, let us introduce the symbol "$^-$" to represent internal negation: $\bar{A}$, which is well-formed when A is, is the internal negation of A. Where A is expressed in subject predicate form, say xf, then $\bar{A}$ may be abbreviated $x\sim f$.

Instead of being pulled out, and extended to a sentence connective, predicate negation may be pushed inward, and absorbed in the predicate, predicates or properties then being said to come in two forms, positive and negative. Such a property restatement of the theory (as it will be called, though some worthwhile generality is lost) has certain advantages: in particular, it helps exclude illicit uses of the Characterisation Postulate, restricting the Postulate in a fairly natural way to "properties" rather than admitting its application simply to wff(all of which are taken, if they contain a free variable, to correspond to predicates). The property restatement of the theory lends itself a little too readily to reductions of the theory of objects, by reducing nonentities to bundles of properties.[1] Some of the initial disadvantages of the property restatement are evident enough, e.g. the serious problem of distinguishing positive from negative properties is introduced, leading thereby to undesirable atomistic elements; the disadvantages can be avoided by sticking with the internal negation formulation, which also has the important virtue of reflecting the data of natural language (rather than trying to force it into a preconceived and narrowly-construed logical mould).

[1] The defects of the reduction will concern us in later chapters [in later volumes —*Eds.*]. The reduction does, however, provide a valuable partial model for the theory of objects.

In fact both negations, external and internal, though they can be interdefined using auxiliaries such as "T", are essential – if the data delivered by natural language are to be taken as presented. The ordinarily understood differences between external and internal negations appear, and have important applications, not only in the inconsistency cases so far focused upon, but also, and in a perhaps less debatable way, in the matter of incompleteness. The complement of the inconsistency feature, the incompleteness feature of negation, that external negation ($\sim xf$) does not generally imply internal negation ($x\sim f$), can be valuably applied as by Meinong, to explicate the incompleteness or indeterminacy of nonentities,[1] to account for apparent truth-value gaps, and to solve the historical problem of the One and the Many, of how abstractions can represent many different individuals with incompatible properties (Mög, p. 170ff; see also Findlay 1963, p. 159ff.).

Consider, first, the apparent puzzle as to the altitude of the golden mountain. How high is the golden mountain? The puzzle evaporates once it is realised that the golden mountain is incomplete in many respects, including altitude. And the requisite incompleteness can be logically represented. Let f represent a feature such as being a 1000 yards high, or 1001 yards high. Then to say the golden mountain is incomplete as regards f is to say that the golden mountain is neither f nor not f. Similarly (as Meinong also explains in GA, pp. 466–75; also Stell) the round square is neither blue nor is it not blue; it is incomplete in fact with respect to colour determinations. What have been (mis)taken as truth-value gaps are really cases of incompleteness.

The traditional problem of how abstractions or generalisations can represent, or be exemplified by, particulars with incompatible features is also explained very simply on the assumption that such objects (e.g. nonattribute universals such as the Triangle) are (necessarily) incomplete items, incomplete with respect to most properties other than those that follow from their characterisations. In this way there is no difficulty about supposing that a universal such as the Triangle, which is indeterminate with respect to property g (say equiangularity) can represent both individual triangle a_1, which has g, and individual triangle a_2, which has $\sim g$. Since objects such as the Triangle are incom-

[1] The distinction will also be applied, in chapter 3 [reprinted in Vol. 2 —*Eds.*], in explicating the incompleteness of entities. According to Meinong, however, objects which exist or subsist are determinate in every possible respect (Mög, p. 180; also GA, p. I, Stell). This thesis, which gets Meinong into some difficulties (cf. Grossmann 1974, p. 178; Findlay 1963, p. 156), is argued against in detail subsequently. Neither entities nor the objects Meinong takes to subsist are always fully determinate.

plete they are open to further determination, they can be "filled out", in different ways, by further characteristics; and this is what happens in exemplification by particulars. The incompleteness of nonentities, whether particular or universal, is explained through the negation distinction by the feature that, contrary to the underlying assumptions of standard logic, such items may have neither f nor its internal negation $\bar{f}$ for some trait f. For the failure to possess feature f does not guarantee that it possesses its opposite $\bar{f}$; e.g. the fact that it is not the case that the present king of France is wise does not imply that the king of France is not wise, that it is not the case that the Triangle is isosceles does not imply that the Triangle is not isosceles; for though the antecedents are true the consequents are not. On these truth-value assignments to statements about the present king of France the theory agrees on the surface with Russell's theory (Findlay 1963, p. 160; *contra* Passmore 1957, p. 229), but in fact it is only agreement in a limited way since the Russellian theory effectively treats *all* properties of nonentities as indeterminate. The famous examples concerning the present king of France are typically used to illustrate just this point, that nonentities have no genuine properties, but only reanalysable features like nonexistence and "secondary" ones such as intensional features. But it does not follow from the fact that many questions about nonentities have no correct answers that *none* of them have correct answers, or that nonentities have no genuine properties. Partial indeterminacy does not entail total indeterminacy.

Recognition of the incompleteness, or partial indeterminacy, of universals enables the rectification of Locke's inconsistent account of abstract notions and avoidance of Berkeley's celebrated criticism of abstractions. Locke went wrong in implicitly applying a predicate LEM to universals, in assuming that if the Triangle is not non-g (e.g. non-scalene) then it is g (scalene). For then as the Triangle is not non-scalene, since some triangles are not non-scalene, the Triangle is scalene. But it is also not scalene, since some triangles are not scalene. So results the inconsistent Lockean triangle that has both all and none of many of the properties of particular triangles:

> the general ideal of a triangle ... must be neither oblique nor rectangular, neither equilateral, equicrural nor scalene; but all and none of these at once. In effect, it is something imperfect, that cannot exist, an idea wherein some parts of several different and inconsistent ideas are put together. It is true, the mind, in this imperfect state, has need of such ideas, and makes all the haste to them it can, for the

> conveniency of communication and enlargement of knowledge.
> (Locke 1975, IV. vii. 9).

Remove the completeness assumption, forced logically by the predicate LEM, and the inconsistency vanishes. There is then no need to say that the Triangle has *all* the properties of particular triangles, but only some of them and Berkeley's objections (Berkeley 1949, *Principles*, Introduction §13), which likewise rely upon predicate LEM, fail.[1] An apparent antinomy is, however, thought to remain.

> For though the abstract, general idea as specified by Locke "is something imperfect, that cannot exist" it apparently has to, if understanding, "communication and enlargement of knowledge" are to be possible. And they obviously are, since they do in fact occur (Flew 1971, p. 434).

But the argument turns on the Ontological Assumption: otherwise we can say what we do say, that communication does not require reference, but may be about what does not exist, such as incomplete objects. It is not true then, as Flew and many others have claimed, that

> Locke and Berkeley together succeeded in erecting a decisive "No through road" sign against one tempting opening (Flew 1971, p. 436).

Meinong marked out the through route (which we will follow in later chapters [in later volumes —*Eds.*]).

In terms of partial indeterminacy, other puzzles, sometimes taken as serious obstacles for theories of items, can also be surmounted. Findlay, for instance, claims a

> fatal weakness in the objects which have no being is that some of them are not fully determined, and about such objects few questions can be significantly asked (Findlay 1963, p. 57).

But indeterminacy does not render questions about indeterminate objects nonsignificant, and far from being a weakness of the theory is a source of strength. Findlay,[2] however,

[1] Berkeley's own alternative account (hailed by Hume as an intellectual breakthrough), of an arbitrary particular triangle "standing for and representing all triangles whatsoever" and being "in *that sense* universal" encounters serious difficulties (despite Berkeley's disclaimer that it seems "very plain and not to include any difficulty in it") as soon as one asks for details of the representing relation and the meaning of universal terms, which, at least on Berkeley's account, are not eliminated.

[2] Inconsistently with what he has subsequently to say about the indeterminacy of incomplete objects.

apparently considers it a fatal weakness of Meinong's theory of objects that it admits any number of "insoluble" problems which arise because some items are not determinate in all respects. Thus

> the folly of the problems which ... perplexed the senile mind of Tiberius: what songs did the sirens sing or who was the mother of Hecuba?

But, once again, Tiberius's questions are certainly significant; for one thing it is a contingent matter that Hecuba did not exist, so he might have been asking of a person that did exist, for another it is true that Florence Nightingale was not the mother of Hecuba. Furthermore the "problems" are *explained*, as Findlay in effect observes, through recognition of indeterminacy, and only appear insoluble on "the assumption that Hecuba had a definite mother, or that the sirens sang a perfectly determinate song". In short, no insoluble problems arise.

Thus Findlay has not here discerned a fatal weakness in nonentities. That such questions as "Is the present king of France bald?" and "Who was the mother of Hecuba?" are significant follows from the significance thesis (I) (and question-declarative sentence connections). Nor are the questions insoluble in any ordinary sense. We know, for example, that it is false that the present king of France is bald. It is important to distinguish indeterminacy from insolubility. To say that a question is insoluble presupposes that it has or should have a determinate answer, which for some reason cannot be decided by given methods. The questions which result in indeterminacy in the theory of items do however have definite true or false answers, for which the particular truth-value can be decided: so these questions are not insoluble. It is not a defect of a theory of items that certain questions have indeterminate answers, particularly when this indeterminacy follows, as it does, from certain truth-value assignments.

For a is indeterminate in respect of f (or f-ness), or af is *indeterminate* if af is false and $a{\sim}f$ is also false, i.e. ${\sim}af \;\&\; {\sim}a{\sim}f$. Thus for instance, (5) and (6) are both indeterminate because both false. But indeterminacy is not restricted to such cases: indeterminacy may also arise in somewhat more complex ways. Consider, for example, the hotel, which in fact is merely possible (but in suitable stories it may be planned or even exist in part), which I am thinking of. Since it is a hotel it is presumably true that it has *some* rooms. But because of incompleteness in the specification of the hotel it is

not true that it has one room, not true that it has two rooms, and so on. Generally it is not true for any given number n that it has n rooms. (On these latter assignments the theory agrees with Russell's theory.) A logic which allows as true for some f:

$$\sim 0f,\ \sim 1f,\ \sim 2f,\ \ldots,\ \sim nf,\ \ldots\ ;\ (Pn)nf$$

is ω-inconsistent. But even if the logic arrived at were to reflect such features of possibilia, it would not be at all damaging. For one thing, inconsistency proper would not result. This sort of ω-inconsistency does nothing to condemn a theory of possibilia: to exhibit it would be a merit of the theory.

It is not determinate how many rooms the envisaged hotel has. Thus the above ω-inconsistency suggests further sufficient conditions for indeterminacy. If $\sim nf$ holds for all natural numbers n despite $(Pn)nf$, then kf is indeterminate. In this case the best answer to the question "Exactly how many x are f?" is: It is indeterminate how many x are f, exactly how many rooms the hotel has.[1] And again the indeterminacy is explained through negation features.

§11. The inadequacy of classical identity theory; and the removal of intensional paradoxes and of objections to quantifying into intensional sentence contexts.

Neutral quantification logic, enlarged by internal negation and the predicates "E" and "$\Diamond$", gives no trouble so long as it is not applied to intensional discourse; once it is applied there is trouble, much trouble with the classical formal theory, in particular with identity theory and description theory.

Standard identity logic is based firmly on the Reference Theory. Since intensional "paradoxes" and prohibitions on quantifying into intensional frames (e.g. binding variables inside intensional functors by quantifiers exterior to the functors) both derive from standard identity logic, both derive ultimately from the Reference Theory; and both are

[1] Similarly, even if it is said to be true that some distance is the mean distance between the planet Vulcan and the star of Bethlehem, because both are heavenly bodies in some common space, it is false that the mean distance between the planets is n light years for any specific n, so the distance is indeterminate. Compare the situation in modal logic where, for example, it is logically necessary that some number is the number of planets in our solar system, but it is false that it is logically necessary that n is the number of planets for any specific n.

removed with rejection of that theory. In short, the so-called problems are once again generated by that faulty theory, and removed with its demise.

The classical logical theory is encapsulated in the definitional equivalence (PM, *13.01, Church 1956, p. 301)

$x = y$ iff $(f)(xf \supset yf)$ (LL, Leibnitz's Law, or better, Leibnitz's Lie),

commonly traced back to Leibnitz. The theory may be equivalently formulated, $x = y$ iff $(f)(xf \equiv yf)$ since symmetry follows from the implicational form, and, more interestingly:

if $x = y$ then $xf \supset yf$ (IIA, i.e. full indiscernibility)[1]

given only reflexivity, i.e. $x = x$. As Whitehead and Russell say (PM, p. 23):

> If x and y are identical, either can replace the other in any proposition without altering the truth-value of the proposition; thus we have
>
> $\vdash : x = y . \supset . \phi\, x \equiv \phi y.$
>
> This is a fundamental property of identity, from which the remaining properties mostly follow.

Indeed with reflexivity the remaining properties entirely follow. For all classical properties flow from LL, IIA yields one half of LL by quantification logic (generalisation and distribution), and the other half of LL results from the following case of instantiation, $(f)(xf \supset yf) \supset . \; x = x \supset . \; x = y$, by commuting out $x = x$.[2] In first order quantification logic, where attribute quantification is not catered for, and so identity is not definable, reflexivity and IIA provide the standard axioms for identity. However IIA is

[1] For the second order schematic form, see Church 1956, p. 302.

[2] Linsky 1977, pp. 115–6 has lost sight of this elementary argument for the identity of indiscernibles. For he vigorously defends indiscernibility of identicals and (later in Linsky 1977) reflexivity of identity, yet sets aside as a separable issue Wittgenstein's objection (in 1947) to the identity of indiscernibles.

Wittgenstein's objection, at least as stated, is not telling: it rests on a confusion of nonsense and logical falsehood. According to the objection,

> Russell's definition of "=" [i.e. LL] is inadequate, because according to it we cannot say two objects have all their properties in common. (Even if the proposition is never correct, it still has sense.)

But $a \neq b$ & $(\phi)(\phi a \equiv \phi b)$ is significant and can be said on Russell's theory; it is simply never correct.

usually restated schematically – to avoid the complexities of substitution upon predicate variables in quantificational logic – as follows:

> $u = v \supset .\ A \supset B$, where B results from A by replacing an occurrence of term u by v, provided the occurrence of u in A is not within the scope of quantifiers binding variables in u or v (IIA scheme).

The classical theory of identity derives from the Reference Theory (as has already been demonstrated, in one way, in §6). Briefly, since according to the Reference Theory *truth is a function of reference*, if u and v are identical, i.e. have the same reference, then $A(u)$ is true iff $A(v)$ is true, by functionality (i.e. applying the definition of *function*); that is IIA holds. Mere elaborate arguments for full indiscernibility similarly rely on the Reference Theory. Consider, for example, Linsky's "proof" (Linsky 1977, pp. 116–7):

> Any singular term ... replaced [with an appropriate variable] in a true statement refers to an object that satisfies the open sentence thus constructed. An object satisfies such an open sentence only if replacing the open sentence's free variable by *any* singular term making reference to the object turns the open sentence into a true statement. ... Consequently the result of replacing a singular term in a true statement by any other singular term referring to the same object leaves the truth-value of the last statement unchanged. Terms of a true identity statement refer to the same thing.

The thesis that truth is a function of reference is already built into the premisses, critically through the italicised *any* in the second statement. The premisses are, as we shall come to see, false. Consider the supposed truth (about the inquiring child J; cf. Linsky 1977, p. 63) "J wants to know whether Hesperus = Phosphorus". Then the object Phosphorus satisfies the open sentence "J wants to know whether Hesperus = y" according to Linsky's first premise. But as Hesperus = Phosphorus the term "Hesperus" is a singular term making reference to the same object, yet it is not true that J wants to know whether Hesperus = Hesperus. So by the second premise the object Phosphorus does not satisfy the given open sentence. Identity of reference does not always suffice for replacement preserving truth.

Not only does the classical theory derive from the Reference Theory: without the Reference Theory the classical connections are in doubt or fail. Consider, as a vehicle

for making the latter point, the stock argument to secure a full-strength (substitutivity of) identity principle, the Indiscernibility of Identicals Assumption. The stock argument runs as follows: If a and b are identical then a and b are one; therefore whatever is true of or can be truly said of or about a should equally be true of or about b since b is nothing but a. Given a purely referential theory of identity – to the effect that identity (and difference) sentences relate just to the *referents* of expressions standing on each side of identity (and difference) signs, and that truth is determined just through reference – full indiscernibility is of course inevitable. But more important, unless such a theory is adopted, the argument is not cogent. For suppose that truth depends not just on reference but on some other factor as well: then oneness of reference of a and b fails to guarantee that what is true of a is true of b because the further factor may not transfer from a to b. Since sense is such a further factor the inadequacy of a purely referential theory emerges directly from Double Reference Theories such as Frege's.[1] And a solid case, grounded on intuitive examples, can be put up for claiming that with an identity sentence, such as "$a = b$", not only the referents of "a" and "b" but also their senses are relevant. For instance, in "Necessarily $a = b$" what is said is said not just about the referent of "a", if any, but involves more, e.g. the sense of "a". Then, however, the conclusion of the stock argument does not ensue. Truth will only be preserved under substitution of (extensional) identicals where only referential features are in question, i.e. (more exactly) in *extensional* contexts. The resulting undermining of the full-strength identity principles has however not been sufficiently noticed, and is not admitted, by Frege though his identity principle is *effectively* qualified through the theory of change of references in oblique contexts.[2]

That the stock argument for the referential theory lacks cogency in fact emerges directly from examples. For there are any number of cases where a and b are in fact identical but what is true of a, e.g. believed or known or thought or conjectured of a, is not true of b. The stock argument also fails in a similar fashion where quotation affects re-

[1] See Frege GB, pp. 56–7. Even Quine, who relies on what amounts to the stock argument to get his critique of modality moving (cf. FLP, p. 139) comes close to repeating some of Frege's points when he writes "Being necessarily or possibly thus and so ... depends on the manner of referring to the object" FLP, p. 148.

[2] Effectively qualified – though seen differently from Frege's own standpoint, the sense-reference theory amounts to a rescue operation for full indiscernibility: see §7.

In the discussion of a further factor, sense is of course only illustrative. The further factor to be taken account of is not really sense, but nonreferential use. Senses are special entities cooked up precisely to obtain the effect of the requisite qualification of LL, without openly challenging its referential character.

placement, but it is only in such cases that an exception to full replacement is recognised. In the face of this failure, qualifications are frequently imposed on the substitution principle with respect to sentence contexts containing quotes, e.g. the principle is said to apply only to first-order contexts or the inevitable use-mention distinction is wheeled out. But, in spite of the similarities, analogous qualifications are not usually imposed on sentence contexts containing intensional operators. Why is the Indiscernibility of Identicals Assumption adhered to so tenaciously in such cases but not in quotational cases? Because, once again, of the Reference Theory. The way in which the name-object (mention-use) distinction removes apparent counterexamples to indiscernibility (e.g. replacement using Cicero = Tully in " 'Cicero' contains six letters") fits snugly into the Reference Theory – mentioning expressions are simply further names referring to linguistic objects – whereas intensional expressions do not fit, at least not without severe distortion, into that theory. The mental paralysis the Reference Theory induces has even led to the idea that all failure of full indiscernibility must be due to the intrusion, somehow or other, of reference to names and not merely to objects. Thus Quine (FLP, p. 140):

> Failure of substitutivity reveals merely that the occurrence to be supplanted is not *fully referential*,[1] that is, that the statement depends not only on the object but on the form of the name. For it is clear that whatever can be affirmed about the object remains true when we refer to the object by any other name.

What is said to be clear is clear *only* given assumptions of the Reference Theory: otherwise it is clear that, when name "a" di ff ers from name "b" but $a = b$, what may be truly affirmed of a, such as that it is necessarily identical with a, may not be truly a ffi rmed of b. Substitutivity (i.e. full indiscernibility) fails not only when the statement depends on the form of the name; it commonly fails for intensional frames which cannot be reconstrued as somehow linguistic or about names.[2] A basic false dichotomy between references (objects) or names of references, also a product of the Reference Theory, underlies the assumption that what is not about a reference and resists substitutions must somehow be about a

[1] This it does show, but in our sense, not Quine's.

[2] For a multiplicity of reasons; e.g. the referential theory of names does not permit translation to other languages, but intensional expressions can be translated; the replacement conditions for linguistic expressions are wrong for intensional expressions; etc. Compare too the objections to theories in the Fregean mode, §7.

name, and accordingly must be paraphrased linguistically to reveal its "true logical form", a referential one.

Of course a linguistic surrogate of the full substitutivity principle can be kept by the terminological strategy of suitably narrowing the application of "property", "condition" or "trait" (or for that matter by a high redefinition of "true of") so that sentence contexts or sentential functions containing intensional or modal operators do not specify properties or traits. But there does not appear to be much justification for this piece of legislation; it is methodologically much preferable to distinguish sorts of properties, e.g. extensional properties or referential properties among properties. A more insidious strategy for hanging on to full substitutivity, which is correspondingly harder to undercut, appeals to a division of subjects into logically proper subjects, e.g. proper names of some kind – for such subjects there are no failures of substitutivity – and remaining subjects, e.g. descriptions, statements concerning which are analysed away through supposedly equivalent statements concerning proper subjects. Such a strategy, which fits snugly into the referential framework, represents the prevailing approach to problems of identity in nonreferential settings: indeed it is often taken, quite mistakenly, as the only viable, or even possible, approach to the problems. Such a referential strategy runs, as we shall gradually see, into insuperable difficulties. Moreover there is a viable, albeit nonreferential, alternative: namely qualifying indiscernibility.

Abandoning full indiscernibility removes at once certain traditional and modern puzzles about identity. A first puzzle generated by the Reference Theory lies in explaining how identity can have any (logical) importance and identity statements be other than trivial.

> It might be thought that identity would not have much importance, since it can only hold between x and y iff x and y are different symbols for the same object.[1] (PM, p. 23).

Whitehead and Russell try to escape this difficulty their theory leads to by appeal to descriptive phrases.[2] But what really happens (though Whitehead and Russell do not explain it, or indeed explain satisfactorily how descriptive phrases get them out of their

[1] As with Leibnitz's famous statement of his law, use and mention are conflated in the statement, but in neither case in a damaging way.

[2] Where the Reference Theory leads *without* epicycling may be seen in Wittgenstein's proposed elimination of identity in the *Tractatus*.

predicament) is that a theory of descriptions with scoping devices offers a backdoor way of *limiting* substitutivity of identity. (This will become clear with the explanation of how such a theory of descriptions resolves modal paradoxes.) Frege in effect argued from the differences between $a = a$ and $a = b$ when both are true to the inadequacy of a purely referential theory of identity, and thereby of full indiscernibility (though Frege did not draw the last conclusion his theory precludes referential replacement in oblique contexts and so, in this sense, limits substitutivity). For given full indiscernibility it would be impossible to explain differences between $a = a$ and $a = b$ when both are true yet they may differ significantly in informational content, modal value, and so on. The solution to the puzzle is simply that de facto truths of identity do not legitimate replacement within intensional sentence frames such as those formed with functors such as "it is trivial that".

The Whitehead–Russell appeal to descriptions (or complex names) and to the informativeness of identity assertions formulated with these, is given a revealing turn in Quine 1959, p. 209. Quine tries to escape difficulties the Reference Theory causes, as to the point and origin of identity statements, by a similar two-fold strategy to that Russell had used, appeals to the imperfection of languages containing complex names and to the informativeness of some identity statements.

Firstly, Quine tries to clear up the difficulty for classical identity theories, that identity statements are always trivial when true, by distinguishing cases like "Cicero = Tully" from cases like "Cicero = Cicero". The statement "Cicero = Tully" is said to be

> informative, because it joins two different terms; and at the same time it is true, because the two terms are names of the same object (p. 209).

This clearing up of the difficulty looks just fine (and *is* fine when indiscernibility is qualified) until we encounter the classical referential theory of identity Quine presents a few pages later (p. 212), whereupon we discover that the noninformativeness of "Cicero = Tully" follows from the admitted noninformativeness of "Cicero = Cicero". More elaborate shifts are required than Quine has offered; either "Cicero" and "Tully" have to be construed as, what they are not, disguised descriptions and scoping methods brought into play, or *noninformativeness* and related functors have to be construed as, what they are not, implicitly quotational.

Secondly, Quine tries to make out that "the need for identity derives from a peculiarity of language"; in the logically ideal language, where language tends to vanish back into that which it copies, identity would be superfluous.

> If our language were so perfect a copy of its subject matter that each thing had but one name then statements of identity would indeed be useless[1]. ([1]Thus it was that Hume had trouble in accounting for the origin of the identity idea in experience ...) But such a [Tractarian] language would be radically different from what we have. To rid language of ... redundancies among complex names ... would be to strike at the roots. The utility of language lies partly in its very failure to copy reality in a one-thing-one-name fashion. The notion of identity is then needed to take up the slack (p. 209).

The underlying Reference Theory picture of language is thoroughly misleading, and is pernicious. It leaves out entirely the bulk of language, which consists of nonreferential discourse; it leaves out the language of thought, perception, dreams, theories, imagination, the worlds and objects there discerned, and so on. Nor is it only because of a peculiarity of language that identity is required. This leaves out of account the nature, and limitations of the users of the language, and the point and purposes of their ordinary nonreferential discourse.

For instance the truth, Cicero = Tully does not legitimate single replacement of "Cicero" by "Tully" in the statement "It is trivial that Cicero = Cicero".

Secondly, abandoning full indiscernibility eliminates paradoxes that emerge as soon as classical identity logic is grafted onto quantified modal logics. The difficulties appear in especially severe form in modal logic S5 (a system defended in EI and RLR as containing essentially the correct sentential logic of logical necessity); but such absurdities,[1] as that all identities are logically necessary, are derivable in any system with good claims to capture logical necessity formally. In logics based on S5 not only is

(1) $(x = y) \equiv \Box(x = y)$

a theorem – a result which holds in weaker systems based on modal logic T but worse

(2) $(x \neq y) \equiv \Box(x \neq y)$

is a theorem. In combating this difficulty various moves are possible:

(A) to eliminate (2) by weakening the modal logic at least to S4, but to keep (1). But since defences of (1) have little more plausibility than defences of (2) and most defences of (1) can be transformed into defences of (2), and since even (1) is rejected by philosophers on various grounds, the source of the trouble does not appear to be S5. And S5 has not just an alibi but also a good defence.

(B) to retain, at least in appearance, the customary (substitution or Leibnitzian) identity criterion along with consequences, in an S5-modalised theory, like (1) and (2); to argue that (1) and (2) are correct, and that apparent counterexamples are only reached by misconstruing the range-values of variables occurring in (1) and (2). By way of restriction it is proposed either

(B_i) To restrict the class of expressions, which can be substituted in the classical identity schemes, and so which can be substituted in (1) and (2), to merely referring or naming expressions, to logically proper names or the like; that is, in effect, to narrow drastically both the class of objects which subjects "a", "b", etc. can legitimately be about and therewith the range of subject variables. Recalcitrant expressions which are not merely referring are replaced by definite descriptions. Or

(B_{ii}) To replace (for certain sentence contexts) the items which subjects designate and over which subject variables range, viz. individuals or objects, by different items, e.g.

[1] Absurdities in the intuitionist sense of really false propositions.

individual concepts. Strategy (B_i) is a characteristic Reference Theory move, strategy (B_{ii}) a characteristic Double Reference Theory move.

Both these moves, which are discussed in more detail below, *in effect reject the Leibnitzian identity criterion* for familiar subjects, such as "Venus" and "the evening star", which refer to individuals but which do not merely refer. Moreover they are *compatible* with the revision of the Leibnitzian criterion as applied to familiar referring expressions.

(C) To revise the identity criterion. After all, why should an analysis of identity, like the unrestricted substitution analysis, which is carried straight over from extensional logics where all properties admitted are extensional, be expected to hold without qualification for modalised logics? There is no good reason for expecting it to and good reasons for expecting it not to hold. Accordingly the standard analysis of identity in restricted predicate logics should be challenged and supplanted by a different treatment, under which various identity criteria are distinguished. Even so the *appearance* of the Leibnitz principle could, once again, be kept by adopting a high redefinition of "property" under which only extensional attributes qualify as properties. But other than "saving Leibnitz" the redefinition lacks virtues; thus a different course is pursued.

Thirdly, abandoning full indiscernibility, in favour of qualified extensional indiscernibility, enables one of Ryle's "unanswerable" objections to the theory of objects to be met. Ryle argues (Ryle 1972, p. 11) that the theory of objects commits Meinong to saying that, since "the morning star" and "the evening star" mean different things, true assertions about each are about different stellar *things*, and that Meinong is accordingly committed to denying plain astronomical facts. Not at all: "the morning star" and "the evening star" are not, according to the theory of objects, *about* different stellar things. The fact that the morning star and the evening star have different intensional properties[1] does *not* show that the objects are different, without an illegitimate appeal to full indiscernibility. What the intensional discernibility of the morning star and the evening star does reveal is that the expressions "the morning star" and "the evening star" do not mean the same, in the sense of not having the same sense. But this would only yield the damaging result that the expressions are not about the same thing given the equation

[1] Such as being believed by the Babylonians to appear in the morning sky. The examples Ryle deploys fail in fact to serve his intended Fregean purpose; for it is just as true of the morning star as of the evening star that *it* shone brightly last night.

of sense with aboutness, an equation (drawn from the RT) that Ryle quite incorrectly ascribes to any theory of objects.

Perhaps the most important result of abandoning full indiscernibility in favour of appropriately qualified substitutivity is the disappearance of so-called paradoxes of intensionality. Since modal paradoxes are representative of these paradoxes, it will suffice to examine modal paradoxes.[1] Consider then, to illustrate generally the problem indiscernibility causes, a typical modal paradox: It is true that

(1) $\sim\Box(\#\text{pl} > 7)$

where "#pl" abbreviates "the number of major planets". But using the true extensional identity

(2) $\#\text{pl} = 9$

and applying indiscernibility to substitute identicals in the truth

(3) $\Box(9 > 7)$

it follows

(4) $\Box(\#\text{pl} > 7)$

Since (1) and (4) are inconsistent, yet the premisses are true, this is certainly a paradox – at least on simple referential assumptions.

Looked at differently, in a way that focuses on substitution, substitution using (2) is not truth preserving in (3) but it is truth preserving in

(5) $(9 > 7)$.

Therefore the sentence context "$\Box(\ldots)$" is r–opaque. It is well worth detouring to explain opacity and transparency; for these notions are at the centre of the dispute about what the intensional paradoxes show. It is common ground that they show opacity; but what does opacity matter? The tougher empiricist thesis (the source is again the Reference Theory) is that the paradoxes reveal, or help reveal, that there is something seriously wrong with, indeed ultimately unintelligible about, opaque contexts, and so with intensional discourse generally. But all that is revealed is that referential theories are inadequate to intensional discourse.

[1] Negatively it does suffice, but positively, when it comes to determining appropriate substitution conditions, it hardly suffices. For strict identity which warrants replacement in modal frames does not licence inter-replacement in more highly intensional frames.

Criteria for transparency and opacity of sentence contexts vary according to identity criteria used in their characterisation. In what follows the notions are distinguished just for extensional identity ($=$) and strict identity ($\equiv$). A particular occurrence of a subject $\langle x\rangle$ in a sentence context $\langle f\rangle$ is *referential* if truth-value is preserved under replacement of $\langle x\rangle$ by any $\langle y\rangle$ such that $y = x$, i.e. if $(y)\,.\ x = y \supset .\ xf \equiv yf$; *modal* if truth-value is preserved under replacement of $\langle x\rangle$ by any $\langle y\rangle$ such that $y \equiv x$, i.e. if $(y)(x \equiv y \supset .\ xf \equiv yf)$. A sentence context $\langle\Phi\rangle$ is r–transparent if for every singular subject $\langle x\rangle$, if an occurrence of $\langle x\rangle$ is referential in $\langle xf\rangle$ (i.e. in context $\langle f\rangle$), then that occurrence of $\langle x\rangle$ is referential in $\langle\Phi(xf)\rangle$, i.e. if $(x)(f)[(y)(x = y \supset .\ xf \equiv yf)] \supset .\ (y)(x = y \supset .\ \Phi(xf) \equiv \Phi(yf))$; otherwise $\langle\Phi\rangle$ is r-opaque.[1] A sentence context (of sentences) $\langle\Phi\rangle$ is *m-transparent* if for every singular referring expression $\langle x\rangle$, if an occurrence of $\langle x\rangle$ is modal in $\langle xf\rangle$, then that occurrence of $\langle x\rangle$ is modal in $\langle\Phi(xf)\rangle$; otherwise $\langle\Phi\rangle$ is *m-opaque*. All extensional sentence contexts are r-transparent; but the converse does not hold. Sentence contexts of the form "$\Box(\ldots)$" and "$\Diamond(\ldots)$", where no intensional functors occur within the brackets, are r-opaque but m-transparent. It is these features that provide the genesis of modal paradoxes.

What follows from the paradox and r-opacity? As with most paradoxes, quite diverse conclusions have been drawn. In particular, given supplementary assumptions, these conclusions have been reached:

(I) The Leibnitz identity criterion is inadequate in intensional sentence contexts. What the r-opacity and paradox arguments show, quite directly, is that

(6) $x = y \supset .\ \Box xf \supset \Box yf$

is invalid. Two theses emerge rather naturally. The first, which is reinforced by the feasibility of modal logics in which (6) is not valid, is that only substitutions based at least on

[1] These definitions result from Quine's definitions in WO upon introducing quotation functions and distinguishing identity criteria. Note that Quine's informal definitions are not unambiguous; e.g. a more satisfactory definition of r-transparency uses undistributed quantifiers, as in

$(f, x, y)\,.\ (x = y \supset .\ xf \equiv yf) \supset .\ x = y \supset .\ \Phi(xf) \equiv \Phi(y, f).$

Note too that Quine cannot formalise these definitions in any language he considers admissible (the English he uses is not), for they involve either attribute quantification or quantification, in the metalanguage, over predicates.

The angle quotes represent the quotation function "qu" of Goddard and Routley 1966.

Contrary to popular misconception, which attributes the transparency notion to Quine, the notion goes back much further: it is deployed in PM, Vol. 2, Appendix C.

strict identities, not substitutions based on extensional identities, are permissible in modal sentence contexts. The thesis generalised to intensional contexts is: *extensional identities*, such as (2), *do not in general legitimate replacements within intensional sentence contexts*. Furthermore, secondly, *any resolution of the intensional paradoxes involves, in one way or another, qualification of the Leibnitz identity criterion*. This is certainly the case, as we shall see, with all the solutions that have been proposed (and these represent pretty well every area of the solution space).

(II) The Leibnitz criterion is correct but cannot be applied unrestrictedly in r-opaque contexts like (3) because these contexts are impure, i.e. they contain quotation essentially. R-opaque sentences, which are really *verbal*, really about expressions, contain when expanded quoted expressions; e.g.

(3) expands to

(3′) $9 > 7$ and "$9 > 7$" is analytic

and (1) expands similarly to (1′). Since (1′), (3′) and (5) are mutually consistent, paradox is beaten. A Pyrrhic victory. For, first, given the standard theory of quotations, (6) is rejected under (II) as not universally valid: the correctness of (I) is thereby virtually admitted. Second, verbal interpretations qualify, as well as the Leibnitz criterion, several other logical principles, e.g. universal instantiation and existential and particular generalisation, and in general, block substitution within and quantification into r-opaque contexts. These heavy sacrifices – though insisted upon by Quine and others – are not at all satisfactorily substantiated and seem quite unwarranted reactions to the paradoxes. For the paradoxes can be alternatively resolved at much less logical cost, and the main logical principles in question can be independently vindicated. Third, given a non-standard but more plausible theory of quotation (e.g. that of Slog), (6) does hold under verbal interpretations but these interpretations then fail to eliminate modal paradoxes unless coupled with an approach like (I), (III) or (IV). Fourth, verbal interpretations of intensional functors have not been vindicated and remain open to extremely serious objections (beginning with the translation objections spelled out in Church 1950).

(III) In order to retain the Leibnitz criterion the class of singular subjects (individual expressions) which can replace subject (i.e. individual) variables is severely curtailed. This is undoubtedly the most popular referential approach. Consider the typical restriction, proposed in (B_i) above, where individual expressions are narrowed to merely referring

expressions. The test for whether an expression is *merely referring* in a context is whether the scope of its *associated description* matters, that is affects truth-value, in that context: it is merely referring only if scope does not matter. The associated description of a name $\langle m \rangle$ is $\langle$the item which is $m\rangle$, i.e. $\langle(\imath x)xm\rangle$, and of a description is the description itself. If scope of the expression is not indifferent in its sentence context, so that the expression is not merely referring, the expression is replaced by its associated description and the description has in that context a sufficiently wide scope, that is a scope under which truth-value is unaffected by taking a wider scope if there is one. A sufficiently wide scope can always be found. In the setting of quantified modal logics with extensional identity (e.g. of the system = S5R* of EI), an expression is merely referring in a sentence context if it is referential in that context.

To illustrate the method consider the resulting solution of modal paradoxes. (3) is (replaced by)

$(3'')$ $[(\imath x)(x = 9)]\,.\ \Box((\imath x)(x = 9) > 7)$

i.e.: $(\exists z)((y)(y = 9 \equiv .\ y = z)\ \&\ \Box(z > 7))$. Using IIA and (2) there follows:

$(\exists z)((y)(y = \#\text{pl} \equiv .\ y = z)\ \&\ \Box(z > 7))$,

i.e.

$(4'')$ $[(\imath x)\, x\#\text{pl}]\,.\ \Box((\imath x)\, x\#\text{pl} > 7)$,

where "$(\imath x)\, x\#$pl" is the associated description of "#pl". But $(4'')$ (i.e. (4)) according to (III) is not inconsistent with

$(1'')$ $[(\imath x)\, x\#\text{pl}]\,.\ \sim\Box((\imath x)\, x\#\text{pl} > 7)$

i.e. with (the replacement of) (1). What amounts to this method, a method which is a straightforward variation of Russell's technique for dealing with names and descriptions which lack actual referents and which already fits within the framework of *Principia Mathematica*, is advocated by Smullyan (in Smullyan 1948)[1] and by Prior (in Prior 1963) and is taken for granted in much of the more recent work in the area, e.g. Kripke 1971, Linsky 1977.

[1] Quine is entirely mistaken in his claim (FLP, p. 154) that Smullyan undertook an *alteration* of Russell's logic of descriptions, and that Russell's theory did not allow differences of scope to affect truth-value where the description succeeded in naming (see PM, *14, especially *14.3).

The Smullyan–Prior technique succeeds formally because it is parasitic on solution (I), because it replaces a modal sentence context where substitution of "b" for "a" using an extensional identity $a = b$ would go bad by an extensional substitution context. If "a" is not modalised then in the relevant logics "a" occurs in an extensional context. Then in general the scope of the associated description of a is indifferent – by

(7) $(\exists!x)f(x) \supset .\ (p,q)(p \equiv q \supset .\ \Phi(p) \equiv \Phi(q)) \supset .$
$\Phi\{[(\imath x)xf]\ .\ ((\imath x)xf)h\} \equiv [(\imath x)xf]\ .\ \Phi[((\imath x)xf)h\},$

a version of PM, *14.3 – and "b" can replace "a" in virtue of the extensional identity criterion. If "a" is modalised then either the scope of its associated description is indifferent or it is not. If the scope is indifferent, then a wider scope can be selected such that the relevant substitution position occurs in an extensional context. But it will not happen with the usual logical modalities (except for special combinations) that scope is indifferent. If the scope of the associated description is not immaterial then the expression substituted for is brought into an extensional context by an adaption of the usual method of replacing a non-extensional context by an extensional context (namely using identity and quantification, to replace xf by $(\exists y)(x = y\ \&\ yf)$). Thus substitution is not really made within a modal context. The Smullyan–Prior technique is tantamount to narrowing the class of individual names so that all but logically proper names need occur only in extensional contexts. Hence *the technique conforms to solution (I)*. Indeed (4″) follows at once from (3) and

(2″) $9 = (\imath x)x\#\mathrm{pl},$

a relation obtained from (2) by replacing "#pl" by its associated description, using a derived rule of quantified modal logics (such as = S5R*), namely the rule:

$$B(y),\ y = (\imath x)A(x) \rightarrowtail B((\imath x)A(x)),$$

where the scope of the description includes all modal (intensional) operators in B.

The Smullyan–Prior technique amounts to a modal application of the usual technique for replacing intensional contexts by equivalent extensional ones, together with a restriction on the interpretation of variables so that a variable can only go proxy for merely referring expressions or logically proper names. Other singular referring expressions are replaced under the interpretation by descriptions, the role of which is regulated

by new scope conventions. To illustrate consider a generalisation of (3), $\Box(x > 7)$. To ensure that the variable ("x") on which replacement is made occurs in a non-modal context this is transformed into the classical logical equivalent: $(\exists z)(x = z \ \& \ \Box(z > 7))$. Since now replacement using an extensional identity such as $x = (\imath x)x\#\text{pl}$ is permissible it follows: $(\exists z)(z = (\imath x)x\#\text{pl} \ \& \ \Box(z > 7))$ and therefore: $[(\imath x)x\#\text{pl}] \ . \ \Box((\imath x)x\#\text{pl} > 7)$, i.e. (4″).

Although the Smullyan–Prior technique is as formally satisfactory as the theory of descriptions and other logical apparatus on which it depends,[1] that is not enough. Difficulties are simply transferred to the interpretation of the symbolism. For under interpretation it re-raises in acute form all the difficulties raised by Russell's sharp distinction between proper names and definite descriptions and by Russell's and Wittgenstein's theories of logically proper names, difficulties intensified, once the motley of intensional operators is admitted. For instance if "Lesbia" and "Clodia" were logically proper names not only $\Box(\text{Lesbia} = \text{Clodia})$ but worse $(\forall x)K_x(\text{Lesbia} = \text{Clodia})$ would be true. It is a short route to the conclusion that there are in English no logically proper names and can be none: the variables have no English substitution values.

(IV) To guarantee the Leibnitz principle the items to which individual expressions relate or refer and over which individual variables range, viz. individuals, are replaced by different items, e.g. individual concepts. Compare (B_{ii}) above. This procedure, pursued according to Quine[2] by Frege, Church and Carnap, though it might, after refinement, suffice for a theory of individual concepts, bypasses the main problems at hand, problems as to the criteria for the (contingent) identity of *individuals*. The procedure becomes practically unworkable when the full spectrum of intensional functors is introduced. (For reasons given in the criticism of theories in the Fregean mode, §7.) And as stressed by

[1] How very unsatisfactory the logical operator is is explained in §12.

[2] See Quine FLP, pp. 152–4 for references and criticism. It is at least very dubious whether Carnap pursues the course attributed to him by Quine, whether Carnap's variables are limited to intensional values. Those formal techniques outlined in *Meaning and Necessity*, which are designed to divert modal paradoxes, and which are independent of the (inadequate) analysis of analyticity in terms of *L*-truth and ultimately in terms of state descriptions, are similar to some of those to be explained shortly. But not only do the interpretations differ markedly. Further, whereas the solution proposed in (I) specifically qualifies Leibnitz's criterion and applies directly to puzzles concerning identity, Carnap's "solution" is much less specific and direct: it requires "translation" of the paradoxes into the notation of his semantical systems. Also Carnap's exposition of some vital notions, e.g. of "individual concept" or as it should be "self-consistent individual concept" and of "x is the same individual as y" in rule of truth 3-3, is insu ffi ciently explicit. Very roughly, however, Carnap's "solution" is the formal mode analogue of the solution proposed in (I).

Quine, even when only modal functors are added the procedure is not, on its own, going to solve problems raised by identity relations and quantifiers in modal sentence contexts: for consider such contingent identities as $a = (\imath x)(p \,\&\, (x = a))$ where p is contingently true, and a is an intensional object, e.g. an individual concept. Then a and $(\imath x)(p \,\&\, (x = a))$ are no more interchangeable (preserving truth) in modal sentence contexts than 9 and #pl. Distinctions between various identity relations, or else distinctions between equalities or equivalences of various strengths (the course adopted by Carnap in explications of the issues), still have to be made. But if these distinctions are made, there is no need to limit or change ranges of variables. Because such distinctions are made and substitutions in intensional sentence contexts are restricted in what follows, variables are *not* there limited to intensional values or required simply (or even at all) to designate intensional objects (in some sense).

(V) The Leibnitz criterion is correct: but certain laws of classical logic, in particular existential generalisation (EG) and universal instantiation ($\forall$I), must be abandoned when non-extensional predicates or contexts are admitted; and, more generally, the binding of variables in modal contexts by quantifiers, since not significant, must be given up. This is the course advocated by Quine. Quantification into non-extensional sentence contexts is impermissible, i.e. variables occurring within such contexts cannot, legitimately or significantly, be bound by quantifiers occurring outside the context.

It is easy to plot out routes by which Quine arrives at his conclusions:

(i) His strictures on quantification and rejection of fully quantified modal logics would follow at once using the verbal interpretation explained in (II). And in exposition (e.g. in Quine 1953) Quine often reaches his position by carrying over results supposed to follow from the verbal interpretation to non-verbal construals of modalities. But not only is the verbal interpretation open to the criticisms levelled in (II); more important the extrapolation is not warranted.

(ii) Quine is forced – on pain of inconsistency – to abandon $\forall$I in modal contexts. For Quine maintains both that the Leibnitz identity principle is correct for all contexts, not just for extensional contexts, and that modal contexts are referentially opaque; from which it follows that $\forall$I is false. Moreover the modal paradoxes can be blocked by abandoning $\forall$I (and the related EG). For in order to use (2), to make a replacement according to the classical Leibnitz principle in (3) and so to get (4), $\forall$I is needed. Thus given that the

full identity principle is secure and that ranges of variables are not to be tampered with, modal paradoxes can be re-employed as reductio arguments against adoption of ∀I and EG in modal contexts. Such reductio arguments are scarcely convincing on their own, especially when the assumed premisses are not at all well secured. There are more direct arguments to the failure of EG and ∀I in intensional contexts based on the Reference Theory; see, e.g. Linsky 1977, p. 117. The arguments typically depend upon construing the quantifiers in such a way that substitution of referential identicals is permissible in the specification of their values, but such referential imports, which are easily avoided, are just what is in question.

(iii) Quine does take more direct routes. His initial strategy then consists in showing that modal contexts are r-opaque. But the argument only shows that either (6) is invalid or that ∀I has to be qualified or... . It is important to emphasize that on its own demonstration of r-opacity of modal sentence contexts establishes nothing except this. It goes little distance towards establishing one of (II)–(IV). It does, however, point to a deficiency in some standard quantified modal logics with identity, where no provision is made for the symbolisation or treatment of contingent identities like (2); where provision is only made for strict identities like $3^2 \equiv 9$. Using such identities replacements can, of course, be made in (3) in virtue of the correct connection (a theorem of =S5R*), $x \equiv y \supset . \Box xf \supset \Box xf$. If, however, the unqualified Leibnitz identity requirements from which these standard treatments begin are kept, all contingent identities vanish in quantified modal logics. A demonstration of this point amounts to a reductio ad absurdum of the full Leibnitz requirement.

Quine's main direct arguments are designed to show that no variables within a modal context (or, more generally, no variables within an opaque construction) can be bound by an external operator or quantifier, that quantification into modal sentence contexts is not possible. There is, however, nothing to stop us particularising[1] on (3) to obtain the truth

(8) $(Px)\Box(x > 7)$

[1] In place of Quine's "intuitive" criterion (ii), in Quine 1947, the following principles, which accord with the theory of items, are used:

(i) A particular quantification is true if for some constant "c" the substitution of "c" for the variable of quantification would render the matrix statement true.

(ii) An existential quantification is true if for some constant, "c", cE is true, and the substitution of "c" for the variable of quantification would render the matrix statement true.

or to stop us from discussing the truth or falsity of

(9) $(\exists x)\Box(x > 7)$.

So it is possible to do what Quine says it is not. But this is not what Quine meant. What his claims regarding quantification into modal sentence contexts reduce to can be put like this: sentences like (8) and (9) are senseless, improper, lack a clear interpretation; so assessment of their truth or falsity is ruled out (or else they are thrown into the false bag along with other nonsense). The fact is, however, that these sentences and their English renditions (e.g. in the case of (9) "There exists an object which is necessarily greater than 7") are significant, are intelligible and understood by most students of logic, and have as clear an interpretation as some sentences of restricted predicate calculus. Furthermore Quine's arguments fail entirely to show that they are not significant. Quine's direct arguments to show that something or other is wrong with quantification into r-opaque contexts follow similar lines. They can be illustrated using example (8). Quine asks (to paraphrase FLP, p. 148 and WO, p. 147):

> What is this number which, according to (8), is necessarily greater than 7? According to (3) from which it is inferred, it is 9, *that is* the number of major planets. But to suppose that it is would conflict with the falsity of (4). In the sense of "necessarily" in which (8) is true, (4) has to be reckoned true along with (3). Therefore with (8) we wind up either with nonsense or else with unintended sense.

Quine's argument is fallacious, given that extensional and strict identity can be distinguished.[1] *Quine's argument rests on an equivocation on "that is"* (in later versions on

[1] Intuitively the distinction between necessary identities and merely contingent identities is clear, and the distinction can be explicated formally. But it is bound to be questioned or rejected by extensionalists because the distinction makes use of modal notions. The dialectic thus leads to an examination of the pragmatico-empiricist indictment of modality, in particular the criticism of Quine (FLP, pp. 20 ff. especially), White 1950, and others, of analyticity and necessity. Part of the criticism, that based in paradoxes of intensionality, is being unmasked in the text, but part is independent and relies upon an indictment of the notion of meaning, and of synonymy in particular. In part the latter criticism of analyticity depends on an elementary mistake, the mistaken equation of synonymy with logical equivalence, in terms of which an attack on meaning is transferred to an attack on the notion of analyticity; in part the criticism depends on a particular analysis of analyticity – according to which a statement is analytic when it is true by virtue of meanings – and is escaped simply by giving an account of necessity independent of meaning, as is done in MTD. But there is more to it than this: what has been demanded, in accord with the Reference Theory, is an extensionally-acceptable explication of an intensional notion, and this is of course impossible to supply. But it is no indictment of intensional notions such as necessity. (A fuller examination of the Quine–White argument against the analytic-synthetic distinction, and of intensional ways in which the distinction can be made out – is however a matter for another occasion.)

an equivocation on "i.e.") *as between extensional and strict identity.* For the number of planets *is*, in fact but *not* necessarily, nine. If the identity in question were strict then substitution in the instantiation of (8) would be admissible and would not lead to attribution of inconsistent truth-values to (4). But the identity (2) is not strict, so its truth does not conflict with the falsity of (4) unless the invalid

(10) $x = y \supset . \ \Box f(x) \supset \Box f(y)$

(which is *not* a theorem of S5R*) is assumed. Using (10) Quine's reduction argument may be represented:

(1) & (2) & (3) & (10)	;	premisses
(9)	;	from (3) by EG, assuming 9E (i.e. by (ii) of a previous footnote)
$(\exists x)\Box(x > 7) \supset (\exists x)(\forall y)(x = y \supset \Box(y > 7))$	;	from (10) by classical quantifier logic
$(\exists x)(\forall y)(x = y \supset . \ \Box(y > 7))$	;	using (9)
$(\forall y)(9 = y \supset . \ \Box(y > 7))$	;	since 9 is such a number
(2) $\supset$ (4)	;	by $\forall$I.
(1) & (4), i.e. (4) & $\sim$(4).		

Quine, exporting, concludes that $\forall$I and EG must be qualified, and *somehow* also concludes that (9) (got from (3) by EG) is not significant! At this stage there are serious and irreparable gaps in his argument; for instance his argument by no means establishes that (9) is not significant. For present purposes, however, these gaps may be disregarded: for as the argument uses the incorrect (10), it does not call into question (9), or the truth of (8), and it fails to impugn quantification into modal contexts.

Nor therefore does retention of (8) – or, if platonistically inclined, of (9) – force us to change or limit the (designation) range of individual variables, or to introduce a domain of individual items in which items if identical at all are strictly identical. Retention of (8), or (9), would only force these results given, what has been rejected, full indiscernibility.

For similar reasons, it does not follow – contrary to Quine's claim (Quine 1947, p. 47) – from the true premisses:

$$(Px)(x = \#\text{pl} \ \& \ \Box(x = 9))$$
$$(Px)(x = \#\text{pl} \ \& \ \sim\Box(x = 9))$$

that, because the matrices under the quantifiers yield contraries, there must be at least two items x such that

(11) $x = \#\text{pl}$

is true. Such a conclusion would only follow given (what does not hold for extensional identity, but only for strict identity):

$$(g(x) \,\&\, \Box f(x)) \,\&\, (g(y) \,\&\, {\sim}\Box f(y)) \supset .\ x \neq y.$$

The argument merely shows that there are at least two items which are not strictly identical such that (11) holds.[1]

Since $a = (\imath x)(p \,\&\, (x = y))$, but $a \not\equiv (\imath x)(p \,\&\, (x = y))$, when p is not necessary, whether or not a is an intensional object, the same moves (as above) can be repeated to block the objection (to adapt Quine FLP, pp. 152–3) to including as values of variables intensional items such as individual concepts. Such objects can be values of variables; but to limit ranges of individual variables to such objects is quite unnecessary: such a limitation appears obligatory only within the context of a Double Reference Theory, only given the (misguided) attempt to reinstate full indiscernibility.

The equivocation that features in Quine's "that is" argument is sometimes smuggled in by way of a neutral items shuffle. It is suggested to us that the morning star is identical with the (description) neutral item, Venus, and that the neutral item is identical with the evening star, and that identity is transitive. Then we are presented with an argument something like this: The morning star is necessarily the same as the morning star. The morning star is however identical with the neutral item (or the item itself, Venus). Thus the morning star is necessarily the same as the neutral item. And so on. The argument fails: for the identity of the morning star with the description neutral item, in this case the planet Venus, is contingent only, and not sufficient to warrant substitutivity in all modal contexts. The notion of a description neutral item is itself confused. Though items are to a large extent independent of descriptions, descriptions, since sensed expressions, are not modally neutral. "The description neutral item" is yet another modally non-neutral description.

[1] The use of neutral quantifiers in rebutting Quine's arguments against modality is, at every point hitherto, inessential. The points made hold even if $\forall$ and $\exists$ quantifiers are used and (designation) ranges of variables are limited to items which actually exist.

(iv) Perhaps Quine's main argument should be expanded in this rather different way: ∀I and EG are already suspect because of existence presuppositions. When modal functors are introduced the situation deteriorates further. Because of failure of substitutivity of contingent identities in modal contexts it is not clear which item(s), if any, the term generalised upon, in quantifying into modal contexts like (2), refers to; it is not even clear that the term specifies a definitely existing item. Until this obscurity is cleared up, we are not entitled to argue:

$$\frac{\Box(9 > 7)}{\therefore (\exists x)\Box(x > 7);}$$

any more than we are entitled to argue

$$\frac{\sim E(\text{Pegasus})}{\therefore (\exists x)\sim E(x).}$$

Certainly neither of these inferences is valid. But is the first inference any more problematic than:

$$\frac{9 > 7}{\therefore (\exists x)(x > 7)?}$$

Is the indefiniteness of reference of (8) any more worrying than the indefiniteness of reference of $[(Px)(x > 7)]$?

The *failure* of the first inference, like that of the third, *is* not *a consequence* of the failure of substitutivity of extensional identities in modal contexts, but *of inadequate existential premisses*. And the worry over indefiniteness stems at least partly from ensuing difficulties in guaranteeing existential premisses. Moreover quantification does not have to be independent of or neutral with regard to means of specifying substitutions for variables right up to contingent identities. Quine seems to suppose that it does; for he claims (FLP, p. 152) that the crux of the trouble with (9) is that a number x may be uniquely determined by each of two conditions which are not strictly equivalent. But results from quantified modal logic with extensional identity (e.g. results 4, 5, 15, 16, A5 of §3 of EI) show clearly enough that introduction and elimination of quantifiers is not independent of whether constants are identified using extensional or strict identities, and hence is not independent of whether determining conditions are extensionally or strictly equivalent.

Doesn't all this indicate a departure from purely extensional quantification theory?

Syntactically it does;[1] but such a departure is inevitable when quantification theory is extended to include non-extensional functors. Thus variables do not do a purely referential job: they go proxy for expressions with nonreferential uses. We are not thereby engulfed in Aristotelian-essentialism, an emendation Quine thinks needed to refloat quantified modal logic (FLP, pp. 155–6; WO, p. 199). By "Aristotelian-essentialism" is here meant: that essentialism, attributed by Quine to Aristotle, under which (to give Quine's opaque formulation, FLP, p. 155),

> an object of itself and by whatever name or none, must be seen as having some of its traits necessarily and others contingently, despite the fact that the latter traits follow just as analytically from some ways of specifying the object as the former traits do from other ways of specifying it.

The second (the "despite") clause is essential because the first clause is almost trivially satisfied. Since $\Box(x = x)$, but $\sim\Box(p\ \&\ .\ x = x)$ where p is contingent, x has necessarily, however specified, the first property of self-identity and non-necessarily the property given by $(p\ \&\ \ldots = x)$. That a quantified modal logic shows "such favouritism among the traits of an object" (FLP, 155) does nothing whatever to establish Aristotelian-essentialism. What is apparently required is that an object (a say) has, however described or not, some feature f necessarily and some feature g contingently though there are specifications, b say, of a such that b has g necessarily. In other words, there is a preferred frame of reference in terms of which the properties of the object a are divided absolutely – i.e. independently of how a is referred to or described, or whether it is – into necessary features and contingent features. Smullyan's technique, which Quine quite erroneously takes as the exemplar of the sort of course that offers "the only hope of sustaining quantified modal logic" (FLP, p. 154), does offer such a preferred frame of reference, with its "fundamental division

[1] The extent to which it does depends on criteria adopted for a "purely extensional quantification theory". One (semantical) criterion suggested in Quine's work is that the values of variables need not be intensions. That the values of variables in quantified modal logic must be intensions is not established by the following invalid argument (effectively that used by Quine against Carnap in MN, pp. 196–7):

> We have that $(x)(x \equiv x)$, i.e. every item (entity) is strictly identical to itself. This is the same as saying that items between which strict identity fails are distinct items – a clear indication that the *values* of variables are intensions, e.g. individual concepts rather than individuals.

For saying that every item is strictly identical with itself is not the same as saying that items between which strict identity fails are distinct items: they may in fact, be (extensionally) identical. $(x)(x = x)$ is also true.

On the semantical criterion highly intensional logics may be "purely extensional".

of names into proper names and (overt or covert) descriptions such that proper names which name the same object are always synonymous".[1] But such a fundamental division of subject terms is itself – like the assumption that successful quantified modal logic supposes a preferred frame of reference – a result of insistence on a full indiscernibility principle in the case of proper names (and thus ultimately on accepting the Reference Theory). For then, where c and d are proper names, if $c = d$ then $A(c)$ iff $A(d)$ for every (nonquotational) frame A. That is, c and d are interreplaceable preserving truth everywhere, and so, by the *salva veritate* test which is sufficient for synonymy, "c" and "d" are synonymous.

But abandon full indiscernibility, and therewith its Reference Theory supports, and the unwelcome features of doing quantified modal logic that Quine has adduced, and many others have uncritically accepted, fall away. Firstly, no fundamental division of names and descriptions is essential. Terms c and d, whether names or descriptions, can satisfy different modal conditions, e.g. though $c = c$ necessarily it may be only contingently true that $c = d$. So too the special case of indiscernibility in Barcan's logic, $x = y \supset \Box(x = y)$, which Quine takes as symptomatic of essentialist presuppositions in quantified modal logic, is not universally valid: such aspects of essentialism disappear. More important, the need for a preferred frame of reference is eliminated, the conditions for Aristotelian-essentialism are not met. The conditions are that if object a, named by proper name "n", has some nonuniversal feature f necessarily and feature g contingently then it has these features absolutely and however else named, even though there are descriptions (descriptive ways of specifying) "b" of a such that modalities are reversed, e.g. g holds analytically of b. The conditions for essentialism thus presuppose the already scrapped fundamental division of names and descriptions, and the assumption that they must be met depends once again on full indiscernibility (in modal contexts). For suppose "c" is another name for a; then $c = a$ whence by full indiscernibility, $\Box cf$ and ∇cg. But let b be another name for a such that $b = a$ and $\sim\Box(b = a)$; for any a such a name or description b can be found, if only by devising a new abbreviated description "b" for a. Then neither $\Box bf$ not ∇bg follow. *Admission of contingent identity destroys Aristotelian-essentialism.* Furthermore let "d" be a description of a such that g follows necessarily from d (as envisaged in Quine's "despite" clause): and let "d'" be a name so introduced

[1] That is, while proper names remain; for without modal ruthlessness, of the sort exhibited by Prior and more recently Kripke, which accepts essentialism, proper names vanish into unexemplified logical placeholders.

that d' is strictly identical to d. Then as $d' \equiv d$, $\Box d'g$; so $\sim\nabla d'g$, i.e. "d'" provides an appropriate name for b. And since $d' = a$ (though $d' \not\equiv a$), object a can be (extensionally) named without essential modal commitment; that is, d' is part of an alternative frame of reference carrying with it different modal properties. To sum up, "the upshot" of Quine's reflections (FLP, p. 156) "that the way to do quantified modal logic, if at all, is to accept Aristotelian-essentialism", is only an upshot within a blinkered, and far from compulsory, viewpoint. When that main component of the Reference Theory, full indiscernibility is removed, it can be seen that quantified modal logic can be done (and done unproblematically) without accepting "a philosophy as unreasonable" as Aristotelian-essentialism. Aristotelian-essentialism would result only if we were to revert to something like, what we have already rejected, a purely referential theory of identity and of the possession of properties or traits, to the effect e.g. that if a possesses properties g and $\Box h$ then b also possesses these properties if $b = a$. On the contrary, what properties and relations a has depends not merely on the reference of "a", but also, and crucially in the case of nonextensional properties, on the *full interpretation of "a", on the nonreferential uses of "a"*.

Quine's question (WO, p. 199) designed to evoke bewilderment, as to modal properties of the cycling mathematician, c, only gets its point when we are not concerned purely with the referent of "c". Even then it is important to remove a familiar ambiguity, which Quine so works into the premisses as to increase the confusion. For the premisses could be represented (using obvious abbreviations, "rat" for "(is) rational", "twl" for "(is) two-legged") either:

1a. $(x)(\Box(\text{math}(x) \supset \text{rat}(x)) \;\&\; \sim\Box(\text{math}(x) \supset \text{twl}(x)))$

2a. $(x)(\Box(\text{cyc}(x) \supset \text{twl}(x)) \;\&\; \sim\Box(\text{cyc}(x) \supset \text{rat}(x)))$

or:

1b. $(x)(\text{math}(x) \supset .\; \Box\text{rat}(x) \;\&\; \sim\Box\text{twl}(x))$

2b. $(x)(\text{cyc}(x) \supset .\; \Box\text{twl}(x) \;\&\; \sim\Box\text{rat}(x))$.

From the much more plausible a-premisses it follows, using: $\text{math}(c)$ & $\text{cyc}(c)$, that: $\text{rat}(c)$ & $\text{twl}(c)$ & $\sim\Box\text{rat}(c)$ & $\sim\Box\text{twl}(c)$. Hence: $\nabla\text{rat}(c)$ & $\nabla\text{twl}(c)$, i.e. c is contingently rational and contingently two-legged. It also follows that it is contingently true that c is rational and two-legged. *These are (the) modal properties of the cycling mathematician*

c. But from the implausible b-premisses it follows classically that: $\sim\Diamond(\exists x)(\text{math}(x)\ \&\ \text{cyc}(x))$, i.e. it is impossible that there exists any thing that is both a mathematician and a cyclist.

The same modal fallacy principle, $\Box(p \supset q) \supset .\ p \supset \Box q$, which leads from a-premisses to b-premisses is needed to get from the correct (and demonstrable)

(12) $(w)(f(w) \equiv .\ w = x)\ \&\ (w)(g(w) \equiv .\ w = x) \supset .\ \Box(w)(f(w) \equiv g(w))$

to

(13) $(x)(f(w) \equiv .\ w = x)\ \&\ (w)(g(w) \equiv .\ w = x) \supset .\ \Box(w)(f(w) = g(w))$.

the disastrous assumption (effectively assumption [4], WO, p. 198) Quine considers needed in order to interpret fully quantified modal logic, because necessary to legitimate quantification into modal positions. But (13) is invalid, as counterexamples readily show; e.g. take "f" to be "is Venus" and "g" "is the morning star". Also (13) is demonstrably not a theorem of more satisfactory quantified modal logics with extensional identity (e.g. system =S5R* of EI): since $[p \supset \Box p]$, which (13) implies, is rejected, so is (13). Why the modal-flattening assumption (13), as opposed to (12), is supposed to be needed for interpreting quantified modal logics is not made clear. In fact it has what plausibility it has only in the context of essentialism. If earlier arguments are cogent extensionalizing assumption (13) is very definitely an undesirable and in no way required for quantified modal logic.

What are the appropriate qualifications on full indiscernibility? Intensional paradoxes arise by intersubstituting ordinary factual identicals within intensional frames, and are blocked by blocking such replacements. Moreover all such replacements should be blocked. For factual identities are identities in fact, identities true for the real world T but not necessarily beyond, whereas the semantical assessment of genuinely intensional functors always involves going beyond T to what is the case in other worlds. The factual identity $x = y$, interpreted as $I(x,T) = I(y,T)$, no more legitimates the replacement of $I(x,a)$ by $I(y,a)$, i.e. the interpretation of x at arbitrary world a by the interpretation of y at world a, than the coincidence, or temporal identity, of x and y at time T legitimates the identification of x and y at time a later than T. The appropriate quali-

fication on Leibnitz's Law is then to indiscernibility in extensional frames, *to extensional indiscernibility*.[1]

Thus the correct logic of (ordinary, factual) identity to add to neutral quantification logic is given by the following schemes:

$x = x$	(*reflexivity* of objects)
$x = y \supset .\ A \supset B,$	*where B is obtained from A by replacing an occurrence (and hence, zero or more occurrences) of subject term x by term y, provided the occurrence of x is not within the scope of quantifiers or operators binding x or y or within the scope of an intensional operator (extensional indiscernibility).*

Strict identity, $\equiv$, is defined in terms of identity and is thus a matter of coincidence of features in all the worlds of modal logic – not *all* worlds, but only the complete possible worlds modal logics consider. The logics and semantics of ordinary, strict, and other identity relations are given and unified in EI, and some of the details will be set out in subsequent sections. Whatever the objections to extensional identity – the objections invariably flow from the Reference Theory or some elaboration thereof – the logical theory at least establishes its viability and coherence, thereby refuting such overstatements as Linsky's (1977, p. 116), that "one cannot coherently think that numerical identity does not entail the qualitative sort", that IIA fails to hold. But surely there is a place for Leibnitz identity among identity criteria; after all it can simply be defined in terms of full indiscernibility? Yes, there is a place, a very limited place, with a role of importance only in rather impoverished languages. And in richer languages, which include quotational devices, Leibnitz identity will either vanish into type identity of symbols, or quotational functors will have to be separated (somehow, even where quotation is implicit) from non-quotational ones, and Leibnitz identity will come to mean a qualification (like that to extensional frames for extensional identity) to nonquotational frames, and so its appearance of absoluteness will vanish.

The dethronement of full indiscernibility removes another part of the case for the

[1] An alternative, but fuller, account of the qualifications on identity replacement, and of the important connected problem of characterising extensionality, may be found in Slog, chapter 7.

hierarchical segregation of languages into object language-metalanguage-metametalanguage, etc., that classical logic has tried to impose.[1] A part of the reason for the prevailing fetish for keeping mention, as distinct from use, out of the object language is that if it were permitted the splendid simplicity of Leibnitz's law would be lost. The simplicity is a falsifying simplicity and it's past time it went.

To set things in perspective: Three main approaches to the interwoven questions of identity and quantification in intensional sentence frames have been distinguished; namely nonreductionist theories, theories in the Russellian mode, and theories in the Fregean mode. Nonreductionist (noneist) theories qualify full indiscernibility and can accordingly treat quantification into intensional frames as in order as it is without reductive analysis, without reduction to some alternative logical form. In contrast, *reductionist* theories (accepting the assumptions of Reference Theory) insist upon full indiscernibility and accordingly have to either reject, or else offer a reductive analysis of, much quantified intensional discourse. The case for the rejection of such discourse, the case presented most forcefully by Quine, has been found wanting. In fact the case fails not only, as demonstrated, from a nonreductionist viewpoint, but also, at least in the case of modal logic, from a reductionist viewpoint, provided some fundamental distinctions, such as that between *proper* names and descriptions, are adhered to, and essentialism, what is sometimes called a "moderate" essentialism, is accepted. Linsky for example, roughs out a case for the claim that

> ... Quine's difficulties in interpreting modal logic ... could have been avoided by scrupulous attention to the distinction between proper names and definite descriptions together with the scope distinctions attendent upon the latter. ... Those of his arguments turning on singular terms turn out to be scope fallacies since they all involve definite descriptions (Linsky 1977, p. 125 and p. 142).

Linsky's case breaks down, however, for discourse more highly intensional than modal: he has no analysis, for instance, for epistemic sentence contexts or for the behaviour of subject terms and variables within the scope of such functors as "*a* wishes to know whether" (see, e.g. Linsky 1977, pp. 63–6). Likewise most of the rest of Linsky's theory[2]

[1] The main case for the hierarchy is always said to be the semantical paradoxes. But that case does not bear much examination: see Goddard and Routley 1966 and UL.

[2] In Linsky 1977, principally a smooth combination of the Smullyan–Prior technique with material on proper names and rigid designators drawn from Kripke.

either fails for, or admits of no obvious or easy extension to, more highly intensional discourse than modal. That is, the proposals work at best for a very circumscribed class of intensional contexts, and break down where the required broader viewpoint is taken, when compartmentalisation is abandoned. For example, while the results of Leibnitzian devastation in the modal case, e.g. that all identities are, when true, necessarily true (accepted by Linsky 1977, p. 142), do not perhaps pass toleration level, the results in such cases as the epistemic (deontic, assertoric, etc.) do become intolerable, e.g. epistemically it has to be required that all true identities are known to all knowers! The theory of proper names as rigid designators is in similar trouble.

Reductive theories divide (as already explained in the separation of (B_i) from (B_{ii})) into theories in the Russellian mode – theories which depend on a basic distinction between proper names, which conform to the Reference Theory and descriptions, which are eliminated, in one way or an other under analysis, the way depending on their scope – and theories in the Fregean mode, Multiple Reference Theories which replace the ordinary objects of reference in oblique contexts by new objects, such as concepts or objects *qua* mode of presentation. The noneist thesis is that none of these reductive theories succeed, or can succeed, without disturbing or scrapping some of the data that has to be taken into account, namely some of the true intensional statements that are or can be made. There are several arguments for the thesis some of which (e.g. the arguments against theories in the Fregean mode) have been presented but many of which (e.g. the case against various attempts to draw, and deploy, sharp distinctions between proper names and descriptions) have yet to come. A main line of argument for the thesis is this: Both styles of reductive theory depend upon an adequate theory of descriptions, theories in the Russellian mode critically as the Smullyan–Prior technique makes plain, and theories in the Fregean mode because true statements, especially intensional statements, are often apparently about objects which do not exist. But there is no adequate reductive theory of descriptions, i.e. no theory of descriptions which succeeds, preserving truth, in eliminating descriptions from all contexts of occurrence.

The matter of descriptions is, in any case, extremely important. For it is on the eliminability of descriptions that the referential case against theories of objects turns. Russell's criticism of Meinong, repeated with variations ever since and often hailed as one of the triumphs of modern philosophy, was that discourse apparently about what did not exist could always be replaced satisfactorily by (referential) discourse about what did

exist, the replacement proceeding by the elimination of nondenoting names in favour of descriptions, followed by the elimination of descriptions (in favour of quantified phrases carrying existential loading). On empiricist theories in the Russellian mode, as contrasted with conceptualist and platonistic theories in the Fregean mode, the adequacy of the theory of descriptions assumes a *double* importance; for description theory has a critical role in accounting, not only for nonexistential discourse, but for intensional discourse, since on strict empiricist principles such things as concepts do not exist and so cannot be referred to in reductive analysis. As has already been glimpsed in §4 however, classical theories of descriptions are inadequate. Once this is shown in detail, the classical referential edifice falls.

§12. Russell's theories of descriptions and proper names, and the acclaimed elimination of discourse about what does not exist.

Classical logic of course provides methods for treating discourse purportedly about nonentities. The most important – and adequate, inasmuch as it *attempts* to take account of intensional sentence frames – of these devices is Russell's theory of descriptions. Many of the projects that a theory of items would accomplish, and all the essential ones, Russell thought he could fulfil within a classical framework through his theory of descriptions. And Russell's theory of definite descriptions does extend the Reference Theory to a point where nonentities can (so to speak) be asserted not to exist and ascribed (in a secondary way) intensional properties. But the theory manages to retain the Ontological Assumption, that only that which exists has true properties, through the assumption that true assertions apparently ascribing properties to nonentities are systematically misleading and not really about nonentities and do not ascribe (primary) properties to them; the surface grammar of such assertions is misleading as to their proper logical form.

Thus Russell would – on the basis of his own theory of descriptions and associated doctrines concerning individuals and proper names – reject assumptions on which the argument so far has relied: that "Pegasus", "Primecharlie", "Zoroaster" and such like are genuine subjects; that the items so-named and nonentities can be values of (subject) variables; and that descriptions are "complete" symbols. The rejection of these assumptions and the adoption of a contextual theory of descriptions like Russell's are related strategies, and Russell naturally develops his case for both at once. But Russell's case

is by no means watertight: *there are many reasons for rejecting Russell's theses about proper names and descriptions.*

The reasons yield in turn reasons for rejecting alternative theories of proper names and descriptions set within the referential framework. But in what follows the emphasis is on Russell's theory of names and descriptions since it is far and away the best articulated and defended of classical theories for coping with nonreferential discourse: while more modern theories of proper names may, at first sight, appear to improve upon Russell's theory, the appearance is not so easily sustained, and other theories of descriptions generally fare even worse than Russell's.

Firstly, Russell's analysis simply assigns all such statements where nonentities have a primary occurrence the value false, with the unacceptable consequences that all such statements are uniformly rejected ("Pegasus is identical with Pegasus" is taken to be just as false as "Pegasus is identical with Cerberus" or the indeterminate "Pegasus weighs two tons"), and that nonentities are indistinguishable one from the other. Secondly, it is very doubtful that Russell's theory of definite descriptions works even in cases it was initially presented as resolving, e.g. in the first of the three puzzles Russell presented (in OD, pp. 47–8) for any theory of denoting it is assumed in Russell's solution that the statement "George IV wished to know whether Scott was the author of *Waverley*" can be analysed preserving meaning by elimination of the description "the author of *Waverley*" as a secondary occurrence in accordance with his theory, but it is dubious whether truth even is preserved under such an analysis.[1] Much more important, the theory yields intuitively incorrect truth-value assignments in very many intensional cases (indeed in all of the three classes of cases already considered, p. 44 ff).

For example, indefinitely many counterexamples to the theory like the following can be devised:

[1] Linsky argues (Linsky 1967, p. 71 ff .) that the analysandum may be true though the analysis (namely "George IV wished to know whether one and only one entity both wrote *Waverley* and was identical with Scott") is false – because George IV did not want to know whether one and only one entity wrote *Waverley*, already knowing this – thereby confirming the truth of

> (13) Linsky argued that it might have been the case that George IV wanted to know whether Scott was the author of *Waverley*, though George IV did not want to know whether one and only one entity both wrote *Waverley* and was identical with Scott.

Linsky then argues, rather convincingly, that none of many possible analyses of (13) that Russell's theory supplies is logically equivalent to (13). If so, Russell's theory succumbs to intensional counterexamples where existence is not an issue.

(7) Meinong believed that the round square is round;

(7′) R supposes Pegasus is winged;

Rescher thinks that the present king of France is a king; free logicians contend that Pegasus = Pegasus; Zimmerman's dictionary of classical mythology asserts the Cerberus has three heads; I dreamt that I owned the nonexistent Pegasus; It is possible that the universe (the domain of entities) has exactly one other individual added to it; etc. etc.

Consider (7). Russell does not offer a single analysis of (7), but rather a choice between two analyses, namely (using standard notation and obvious abbreviations):

(i) $B_M[(\imath x)(r(x)\ \&\ \mathrm{sq}(x))]r((\imath x)(r(x)\ \&\ \mathrm{sq}(x)))$,
i.e. $B_M(\exists x)\{r(x)\ \&\ \mathrm{sq}(x)\ \&\ (y)(r(y)\ \&\ \mathrm{sq}(y) \supset .\ y = x)\ \&\ r(x)\}$,
i.e. $B_M(\exists!x)(r(x)\ \&\ \mathrm{sq}(x))$; and

(ii) $[(\imath x)(r(x)\ \&\ \mathrm{sq}(x))]B_M r((\imath x)(r(x)\ \&\ \mathrm{sq}(x)))$,
i.e. $(\exists x)\{r(x)\ \&\ \mathrm{sq}(x)\ \&\ (y)(r(y)\ \&\ \mathrm{sq}(y) \supset .\ y = x)\ \&\ B_M r(x)\}$.

Both (i) and (ii) fail as analyses of (7). For (7) is true; Meinong did believe, however perversely, that the round square is round. But (i) is false because Meinong did not believe that the round square exists, and (ii) is false because a round square does not exist. As neither proposed analysis has the same truth-value as (7) itself, Russell's theory is incorrect.

The orthodox rival theories of definite description, those presented by Frege and by Hilbert–Bernays, fare no better. Under Frege's theory, also adopted in essentials by Carnap and Quine, (7) is supposed to be equivalent to, what is almost certainly false, "Meinong believed that the null set is round"! On Hilbert–Bernay's theory, (7) cannot even be expressed; indeed "a does not exist", where true, is inexpressible on this theory!

It could be objected that (7) is not a genuine example of a sentence containing a definite description, as "the round square" is a universal term like "the Triangle". But firstly, "the round square" can serve as a definite description (it has the same dual role as "the horse") and secondly, the example is easily varied with no reduction in damage, e.g. consider "the round square that was Meinong's favourite". Or consider (7′), which was also selected to bring out another key stage in the reductive analysis. (7′), it is true, contains no description, but all nonreferring names are treated in Russell's theory as

disguised descriptions; so it contains a disguised description and a first step in analysis is to make that description explicit. Thus Pegasus is replaced by some description with the same force, e.g. "the winged horse which... ". As it is pretty unclear which description will serve, let us use Quine's formal expedient, introduce a predicate "pegasises" and replace "Pegasus" by "the entity which pegasises", $\imath x p(x)$ for short. Then (7′) is said to be logically tantamount to

(7″) R supposes $\imath x p(x)$ is winged.

And now the same problems as with (7) arise; for it is or may be false both that R supposes there exists a unique object which is winged ... and also that there exists a unique object which R supposes to be winged.

Russell's theory of indefinite descriptions fails in a similar way for many intensional cases. According to this theory (see MP, 18) the sentence "an entity which is ϕ is ψ" is logically equivalent to "Some ϕs are ψs", i.e. equivalent to $(\exists x)(\phi x \ \& \ \psi x)$. But counterexamples to the analysis can be constructed from examples like: R supposes that a particular winged horse (Pegasus) is winged; It is logically necessary that a perfect diamond is perfect; It is commonly acknowledged that a king of France is a king.

Furthermore, though this is a much more controversial claim (the data having been rendered soft by referential theories), Russell's theories bring out the intuitively wrong assignments in many extensional contexts as well. For example, the theories assign value false to the apparent truths: Pegasus = Pegasus; a (particular, arbitrary) unicorn is equine; Pegasus is a winged horse; a mythical king is still a king; God is wise; an (the) ideal gas satisfies Boyle's law.

Another deficiency of Russell's theories of definite and indefinite descriptions which the counterexamples point up, is the matter of scope artifices: their occurrence, their *ad hoc* character and their multiplicity (just consider the scope ambiguity of B_M(7)), and the fact that there is no *effective* indication as to *which* scope is to be taken. Though Russell's theory, unlike ruder theories of descriptions, uses scope ambiguities to great advantage and often manages to escape total disaster by appeal to scope artifices, the theory offers no guide as to which analysis is correct or when a particular analysis is correct. Scope devices are not a satisfactory way, because so ineffective, nor as the counterexamples show an adequate way, of coping with lack of existential import in intensional contexts.

A related deficiency of each theory is that it does not offer a single uniform definition to cover all contexts. The theory has to make exceptions for the ontic predicate "exists", and really for its many compoundings (e.g. "perishes", "creates"); and it does not cater at all for other status predicates such as "is possible", but if it were to it would have to make further exceptions. More importantly, the theory has to recognise ontic (or status) predicates as a separable class of predicates, and it has to require that the intensional elements in predicates can be isolated into connectives so that scoping artifices can apply. In short, despite initial appearances, the theory has to recognise a certain classification of predicates, and to presuppose a range of sometimes *ad hoc* extralogical analyses of natural language sentences which bring the sentences into proper logical form for the theories to apply.

There is sometimes little reason to accept these preliminary analyses. There are, for example; no compelling reasons for accepting Russell's theory of proper names and Russell's restriction of ranges of variables to entities, or for accepting Russell's thesis that descriptions are incomplete symbols either in the sense that they do not have a sense or reference in isolation or in the sense that they are not values of variables, or in the sense that they are not constituents of correctly analysed declarative sentences. Russell's arguments designed to show that descriptions are incomplete symbols, for instance, are invalid once separated from a narrow and implausible reference theory of meaning. Let us consider Russell's arguments[1] in detail.

Russell has to rely throughout – else his theory fails to deliver the promised results – on a sharp and absolute distinction between (logically) proper names and descriptions, a distinction (not recognised in natural languages which allow a fairly free interchange of names and associated descriptions) which has the consequence that such apparently satisfactory names as "Pegasus", "Romulus" and "Churchill" are classed as disguised descriptions. In fact the requirements on logical proper names are so severe that not only do *no* ordinary proper names, nor anything much in ordinary speech, qualify, as Russell admits:[2] they are so severe that no language could qualify; no names are logically proper. A *logically proper* name, according to Russell, (e.g. MP, p. 20) is (a′) one used to designate an entity of which the speaker is directly aware when speaking, and (b′) it designates

[1] See, especially, PM, pp. 66–7, OD, MP, PLA.

[2] The demonstratives "this" and "that" used with reference to sense-data are cited as examples of terms in everyday discourse approximating to logically proper names.

what it does without saying or implying anything about it. So, in particular, where "a" is a logical proper name, neither "a exists" nor "a does not exist" are significant (PM, pp. 174–5; PLA, p. 201); for were "a exists" true, something would be implied about a contradicting clause (b′). Yet for clause (a′) to be satisfied a must exist. The requirements imposed on logically proper names are inconsistent. Yet the requirements cannot readily be weakened (see the arguments of PLA, and of Wittgenstein 1947). Moreover each requirement (a′) and (b′) separately leads to trouble. Consider (b′); it

> seems to be an impossible requirement. For designation is essentially the selection of something for attention by means of a sign, and a sign which is to serve this purpose must have some implication, though this need be no more than the notion that there is something which it designates for a certain group of persons. (Kneale[2] 1962, p. 598)

Yet (b′), or something like it, is unavoidable if Leibnitz's Law is to be retained. For let "c" and "d" be two logically proper names for the one entity such that use of "c" to designate the entity c says or implies that c has property f but use of "d", perhaps does not. Then it is possible that someone's intensional attitudes discern c from d (even if mistakenly), thus furnishing functors which counter full indiscernibility (of c and d), and so Leibnitz's Law. Briefly, logically proper names can carry no content, in particular no descriptive content, if they are not to foul up full indiscernibility.[1] The epistemological requirement (a′) on its own (which could be satisfied by names of a curious cast) is insufficient to uphold Leibnitz's Law. But when supplemented (a′) leads also to trouble: not only does it exclude names of anything but what presently exists and is perceived by the speaker, but really it precludes the repeated use of names over time, with the end result that *names* are sacrificed altogether and only grunts and the like remain.[2]

As it appears impossible, then, to attach the predicate "is a logically proper name" correctly to any name, Russell's own arguments (PLA, pp. 241, 256) against distinctions without contrasts, may suggest that the distinction is otiose. On the contrary, this vacuous contrast is of the utmost importance in retaining classical logical theory as the theory which supplies the logic in contexts of philosophical interest such as epistemology

[1] Given, that is, that rather drastic alternatives are ruled out, such as that there is really only one property, so that if a thing has a property at all it has The Property. In case this seems to be too silly to record, recall classical logic with its One True Proposition and One False Proposition.

[2] Details of the argument are to be found in Wisdom 1952, chapter 7. See also the telling criticism of logically proper names made by Wittgenstein 1953.

and philosophy of language; without the contrast full indiscernibility is constantly in difficulties. The outcome of such a retention is curious and bizarre. Individual variables being placeholders for logically proper names hold places classically for nothing. Thus classical logic strictly has no direct application to ordinary intensional discourse. It is an "ideal" limit into which such discourse is to be translated – if it can. Leibnitz's Law is satisfied at this (unapproachable) limit. However it is already vacuously satisfied: we can all agree that it holds under replacement of variables for logically proper names, and that no time need be wasted upon searching for counterexamples. A corollary is that the popular procedure in quantified modal logic (pioneered by Marcus) of combining the Smullyan–Prior technique with a substitution interpretation of quantification fails when extended beyond the narrow intensional confines of modality. For when so extended, proper names disappear, and therewith all requisite substitution instances.

The proper names/descriptions distinction would hardly matter so much were it not that Russell proceeds – as he is bound to proceed given classical logic – to exclude all descriptions as genuine subjects and as (replacement) values of variables. Russell thinks that only certain names may be substituted for free variables, and that fallacies occur when descriptions are substituted for variables. For instance, he claims (MP, p. 21) that we commit a fallacy if we attempt to infer from $x = x$, without further premisses, that the author of *Waverley* is the author of *Waverley*. Russell argues:

> If "x" is a name, "$x = x$" is not the same proposition as "the author of *Waverley* is the author of *Waverley*", no matter what name "x" may be. Thus from the fact that all propositions of the form "$x = x$" are true we cannot infer, without more ado, that the author of *Waverley* is the author of *Waverley*.

But why should subject variables be restricted to name variables? Russell has conceded himself the point at stake by restricting his variables to purely name variables. It would appear, however, that we can extend the range of variables so that descriptions as well as names may be substituted for variables: then we can infer, as we should certainly hope, $a = a$, where "a" is a description, from $x = x$ without further ado.

Russell has what he regards as crushing objections to widening the scope of variables, to admitting descriptions as values of variables (PM, p. 67; MP, p. 20; PLA, p. 245). The objections are not crushing; for Russell conflates arguments for these distinct points:

(a) descriptions are not proper names, and

(b) descriptions are incomplete symbols and so not values of variables.

While some of Russell's arguments for (a) do carry weight – for instance the point that whereas the "meanings" of descriptions are determined by the meanings of the separate symbols of which they are composed, the "meanings" of proper names (commonly) are not – these arguments do not support (b). Nor do Russell's arguments render the distinction necessary, in the way he thinks. He argues:

> you may turn a true proposition [namely "George IV wished to know whether Scott was the author of *Waverley*, but he did not wish to know whether Scott was Scott"] into a false one by substituting "Scott" for "the author of *Waverley*" This shows that it is necessary to distinguish between a name and a description (Russell 1959, p. 84)

On its own, without names being contracted to logical proper ones it does not show this at all. For precisely the same points (regarding opacity) can be made in cases where two ordinary names, or two designations, are involved in place of "Scott" and "The author of *Waverley*". Consider, e.g. "B wished to know whether Paterson's Curse is the same as Salvation Jane, but . . . ".

Although descriptions do differ from proper names in various respects (thus while descriptions clearly have a sense whether proper names have a sense is a conflict issue), close formal connections bind descriptions and proper names. For every definite description a logically identical proper name can be introduced; and for every proper name a logically identical definite description can be introduced in these ways (with "$\imath$" read, neutrally, "the"): $a = (\imath x)(x = a)$; $a = (\imath x)x$ a-izes (Quine's device); $a = (\imath x)(x$ is correctly called qu$(a))$. In contrast, usual reductions of names like "Romulus" and "Aristotle" to translated descriptions are inadequate, because they rest only on contingent identities and so do not guarantee the transfer even of modal properties. For this reason the following suggested replacements fail: "Romulus" by "the person called 'Romulus'" (PLA, p. 243); "Aristotle" by "the philosopher born at Stagyra who . . . " (Frege); "Homer" by "the author of the *Iliad* and the *Odyssey*" (MP, p. 23). For instance, it is not logically necessary that Aristotle was born at Stagyra.

More generally, there are no natural language descriptions – as distinct from formally devisable ones, with natural language renditions, which permit replacement in modal

frames – through which proper names can be regularly eliminated, in a way which preserves requisite modal properties. And when the full range of intensional properties is taken into due account ordinary proper names have, in general, no descriptive replacements, whether by a single description or, as in Searle (1958 and 1969), by a set of associated descriptions. Ordinary proper names are not concealed descriptions, and not somehow contextually reducible to such (the issues of proper names are taken up again in a subsequent section).

To come to (b), which is fundamental. Granted that a description like "the author of *Waverley*" is not a proper name, still why not abbreviate, or replace, the description with a proper name such as "Autwav" or, say, "*c*"? For this reason Russell argues (PM, p. 67): If "the author of *Waverley*" were abbreviated by a name "*c*" then

(8) Scott is the author of *Waverley*

would be synonymous with

(9) Scott is *c*

Russell claims, rightly enough, that if *c* is anyone except Scott then (9) expresses a false proposition. But he also claims, unconvincingly, that if *c is* Scott then (9) expresses the same proposition as

(10) Scott is Scott

which is a trivial proposition and plainly different from (8). For in the sense of "proposition" in which (10) is the *same* proposition as (9), triviality does not transfer from (10) to (9), and (10) though the same proposition as (9) differs in respect of triviality.

Two senses of "proposition", frequently confused, should be distinguished. In the stronger sense, p and q express the *same proposition* if and only if, for every (nonquotational predicate) Φ, $\Phi(p) \equiv \Phi(q)$. In the weaker sense, p and q express the same proposition, or the *same statement* (as will be said, to keep the notions distinct), if in addition one is obtained from the other by substitution of identicals. "Proposition" and "statement" may be defined from these sameness relations by abstraction.[1] Leibnitz's Lie demolishes the distinctions; for according to it identities are always intersubstitutible

[1] The notion of proposition defined is a strict one. Less strict notions that appear to have philosophical applications may be defined by further circumscribing the class of predicates Φ which transfer *salva veritate*. Details of such definitions, and of the theory of statements and propositions may be found in V. and R. Routley, "Synonymy and propositional identity", unpublished.

in every nonquotational frame; and hence statement identity merges with propositional identity. Thus many of Russell's arguments, which are correctly rejected as invalid, may be reinstated given Leibnitz's Lie as a further premiss.

Now (10) makes the same statement as (9) if Scott is c; but (10) does not express the same proposition as (9) or (8). For such nonquotational predicates as "It is logically necessary that", "J does not believe that" and "George IV wished to know whether" do not transfer from (10) to (8) or to (9) preserving truth-value. Thus (10) is plainly different from (8), at least because (10) and (8) express different propositions. Furthermore the sameness-of-statement relation does not preserve triviality and informativeness. The very example under discussion illustrates this point; for (8) is informative though (10) is not, yet (8) and (10) make the same statement. It is now clear that Russell's argument does not establish the desired conclusion (b). For though (10) is trivial and analytic, and does make the same statement as (8), (8) is neither trivial nor analytic.

In Russell's generalisation of the argument (PM, p. 67), the immediate issue is not whether "$\imath x \phi x$" is a proper name, but whether it has a meaning in isolation and so can behave in *logical* respects like a proper name, for example by being a value of subject variables. The chief issues, all fused together as concerning the completeness of descriptions are: Does "$\imath x \phi x$" have a meaning in isolation? Can it be defined in isolation, non-contextually? Does it vanish from all its contexts under correct analysis of these? Can it be the value of variables? Russell's generalisation is designed to secure *his* answers on all these issues, and in particular the point that "$\imath x \phi x$" is not a value of variables. He argues

(11) $a = (\imath x)\phi x$

is true or false but never merely trivial like

(12) $a = a$.

But if "$(\imath x)\phi x$" were a value of a variable, (like) a proper name, (11) would be either false or trivial. For if (11) is true, then, by substitution of (11) in itself, (11) would express the same proposition as the trivial proposition expressed by (12). This argument is fallacious. For if (11) is true then it makes the same statement as (12), by substitution: but it does not express the same proposition because modal and intensional properties do not transfer preserving truth across the identity. Furthermore the proposition expressed by (11) is not trivial in the way that the *different* proposition expressed by (12) is. Consequently

Russell's generalisation, an early version of the paradox of analysis, fails to show that "$(\imath x)\phi x$" cannot be a value of individual variables. Thereby Russell's next point, that "since y [or a] may be anything ... $(\imath x)\phi x$ is nothing", designed to show that "$(\imath x)\phi x$" does not have a meaning in isolation, is also destroyed: for once the main argument is undercut what is there to stop $(\imath x)\phi x$ from being a, which is not nothing (no item)? The x which Russellizes is Russell, who is not a nonentity.

Russell attacks the suggestion that "Scott" and "the author of *Waverley*" are two names for the same object (PM, p. 67). However, his argument depends on some very special assumptions about names which, while they may apply to logically proper names, do not apply to proper names generally. Even if "the author of *Waverley*" is counted as a name, it does not thereupon follow that it is a necessary condition for the truth of (8) that Scott be *called* "the author of *Waverley*". For names need not be used. Russell (PM, p. 67) has conflated (8) with

(8′) Scott is called "the author of Waverley"

as his arguments reveal. But someone who claims that (8) is equivalent to the statement that "Scott" and "the author of *Waverley*" are two names for the same object, that is to the statement " 'Scott' and 'the author of *Waverley*' designate the same object", is not asserting (8′), and is not asserting a statement about names in the sense that (8′) is "about names". Once again, Russell's argument does not show that "the author of *Waverley*" cannot be treated logically like a name.

Elsewhere (MP, pp. 20–21; PLA, p. 246) Russell contrasts (8) with

(13) Scott is Sir Walter

He claims that when names are used directly, are used as names and not as descriptions like "the person named 'Sir Walter' " then (13) is the same trivial proposition as (10). This is not so. (13) is the same statement as both (9) and (10), but it is not the same proposition as either (8) or (10). In fact as someone may ask whether Scott is Sir Walter, expecting information, (13) is not completely trivial like (10). These points are better elucidated through examples, analogous to (13), like "Cicero is Tully" and "Hephaestus is Vulcan". The trouble is, of course, that none of these names, indeed no ordinary names, resemble logically proper names in their main features, for instance in being purely referring and only significantly used if the denotation is ostensively indicable. Common or garden names, like descriptions, do not have the requisite features.

Indeed – though this point is not essential to the case against Russell – the notion of a logically proper name here required appears inconsistent.[1] If "Cicero_L" and "Tully_L" say, are logically proper names, then, since they are *purely* referring they should be interchangeable in all nonquotational contexts preserving propositions. Therefore since "Cicero is Cicero" is necessary,

(14) $\Box(\text{Cicero}_\text{L} = \text{Tully}_\text{L})$

follows.[2] On the other hand, that "Cicero_L" is a logically proper name of Cicero implies, or presupposes, that Cicero exists. Similarly that Cicero_L is identical with Tully_L implies or presupposes, that Cicero exists. There is a built-in proviso on the very occurrence of logically proper names that the items named exist: logically proper names, like Hilbert's descriptions, may only be introduced subject to the satisfaction of an (implicit) existence assertion. Now a logically necessary statement cannot imply, or presuppose, a contingent statement; the familiar arguments for the fact that a logically necessary statement cannot imply a contingent statement extend directly to presupposition as well. But it is a contingent matter whether Cicero exists. Hence an identity statement which implies, or presupposes the statement that Cicero exists cannot be necessary. Hence

(15) $\sim\Box(\text{Cicero}_\text{L} = \text{Tully}_\text{L})$.

Since a contradiction results from the assumption of logically proper names, logically proper names are impossible. Or, since (15) is true, (14) is false, and logically proper names of the sort "Cicero_L" are impossible. Since no logically proper names exist, many of Russell's primary assertions about logically proper names are false, according to Russell's theory of descriptions. *Logically* proper names represent an attempt to get beyond *names* altogether, back to their ostensible denotata, things neatly slotted into facts: but since names are distinct from their denotata, this is impossible.

Russell's final argument (in PM, p. 67), to show that descriptions do not have a meaning in isolation, rests on an equivocation on "means the same as". Russell argues, first, that "the author of Waverley" cannot mean the same as "Scott", because if it did

[1] The argument which follows is different from those used against logically proper names earlier in the section.

[2] Russell asserts roundly that (13) is a tautology: PLA, p. 246. Both Smullyan and Prior, developing Russell's theory, affirm propositions like (14): see EI. The thesis that all true identity statements are necessary is a commonplace of modal theories in the Russellian mode, e.g. Kripke 1972, Linsky 1977.

(8) would mean the same as (10), which it does not. To guarantee this argument "means the same as" must be synonymous with

(i) "has the same sense as", not with

(ii) "has the same denotation as".

Mere sameness of denotation (reference) of two subjects does not guarantee synonymy of the sentences in which one is substituted for the other; indeed it does not even guarantee truth-preservation, as substitutions in sentences like "it is logically necessary that Scott is the author of Waverley" show. As "Scott" only has the same denotation as "the author of Waverley", it does *not* follow that (10) has the same meaning as (8). All this first argument demonstrates is that "Scott" does not have the same (Fregean) sense as "the author of Waverley"; for, if it did, (10) would follow from (8) by Frege's substitutivity principle.

Russell argues, second, that "the author of Waverley" cannot mean anything other than "Scott", or (8) would be false. This argument turns on taking "means the same as" as synonymous with (ii), not with (i) as in the first part of the argument. Hence the equivocation. That "Scott" denotes the same item as "the author of Waverley" is, however, a necessary and sufficient condition for the truth of (8). So Russell's conclusion, that "the author of Waverley" means nothing, does not follow *without* the equivocation: What is true is that "the author of Waverley" has the same reference as "Scott", not that it has the same sense. A related equivocation is also made on the expression "can be understood on their own".

The equivocation on "means the same" is tantamount to an equivocation on "means", upon which the following argument rests:

> The central point of the theory of descriptions was that a phrase may contribute to the meaning of a sentence without having any meaning at all in isolation. Of this, in the case of descriptions, there is a precise proof: [1] If "The author of Waverley" meant anything other than "Scott", "Scott is the author of *Waverley*" would be false, which it is not. [2] If "the author of *Waverley*" meant "Scott", "Scott is the author of *Waverley*" would be a tautology (i.e. logically true), which it is not. Therefore "the author of *Waverley*" means neither "Scott" nor

> anything else – i.e. "the author of *Waverley*" means nothing, Q.E.D. (Russell 1959, p. 35).[1]

For the second premiss [2] to be true, "meant" must amount to a meaning equation of at least logical strength (e.g. "necessarily has the same denotation as", or, differently (i)), otherwise (if, e.g. "meant" amounted to a contingent relation such as is expressed by (ii)) "Scott is the author of *Waverley*" would not be logically true but merely contingent. But then the first premiss [1] would fail; for that "Scott" differs logically in meaning from "the author of *Waverley*" does not imply "Scott is the author of *Waverley*" is false. For the latter to happen, and premiss [1] to be true, "meant" must amount to a denotation equation (viz. what (ii) expresses); but then, as explained, premiss [2] fails.

Russell tries (OD, pp. 49–50) to meet theories based on a sense/denotation distinction, or which distinguish meaning from denotation by charging that the theories of meaning thereby adopted are incoherent. But Russell's argument rests on mistaken assumptions from the outset, in particular these (OD, p. 47):

(a) When C occurs it is the denotation that we are speaking about, but when "C" occurs it is the meaning;

(b) The meaning denotes the denotation.

But (b) is simply false, since it is the denoting expression which denotes its denotation; and the sense (or meaning) of an expression is not itself a denoting expression but rather is a property of certain denoting expressions. The relation between sense and denotation is not a denotation relation: the sense fixes the comprehension and it limits the actual denotation classes. Since (b) follows from (a), (a) too is false. The phrase "speaking about" used in formulating (a) is ambiguous. Insofar as the phrase is tied down to denotation, as suggested by the first clause of (a) it appears that when "C" occurs we are *speaking about* the expression (here what denotes the denotation) and *not* about the meaning. So a denoting expression is not thereby debarred from having, as well as a denotation, a sense; and the sense is not the quotation-name of the expression. An expression such as "C" has, in general, many different features;[2] denotation may be one of these, sense another. (And sense, properly understood, is not a further sort of denotation.)

[1] The argument could also be stated with meaning giving a relation between terms and objects, e.g. with " 'the author of *Waverley*' means Scott" in place of " 'the author of Waverley' means 'Scott' ".

[2] See, e.g., the discussion in Goddard and Routley 1966.

When (a) and (b) are removed Russell's argument (OD, pp. 47–48) crumbles. In fact the resources of a sense/denotation theory are not required to reveal Russell's equivocation on "means the same": it is enough to distinguish referential and non-referential uses of subjects.

Since Russell has established neither that descriptions have no meaning in isolation nor that descriptions cannot be values of subject variables, part of the pressure to eliminate descriptions definitionally or to analyse expressions containing descriptions so that descriptions disappear is removed. Russell has however further arguments to show that "the definition sought is a definition of propositions in which this phrase occurs, not a definition of the phrase in isolation" (MP, p. 19), and that (PLA, pp. 247–8) "when a description occurs in a proposition, there is no constituent of that proposition corresponding to that description as a whole".

One argument goes like this (PLA, p. 248; PM, p. 66):

1. There are significant (and true) propositions denying the existence of "the so-and-so"; for example "the greatest finite number does not exist".

2. Such propositions could not be significant if the so-and-so, e.g. the greatest finite number, were a constituent of the proposition, because it could not be a constituent when no so-and-so exists.

3. Such propositions do not contain the so-and-so as a constituent.

Hence an analysis of these propositions must be provided in which "the so-and-so" disappears. Premiss 2 is, however, unacceptable; and it does not hold unless special postulates of logical atomism are introduced, postulates such as that the constituents of propositions must be actual and that (PLA, p. 248) the constituents of propositions are the same as the constituents of corresponding facts. Otherwise the notion of "a constituent of a proposition" is not well-determined. It is not clear that propositions, as distinct from sentences, have constituents; and the phrase "the so-and-so" *is* a constituent of the significant sentences in question. So outside the setting of logical atomism this argument is unconvincing.

Related arguments have been extracted by Strawson (OR, p. 317). Slightly adapted these are:

A. Suppose 1. The phrase "the king of France" is the subject of sentence S, i.e. "the king of France is wise".
Then 2. As S is significant, S is a sentence *about* the king of France.
But 3. If there in no sense exists a king of France, the sentence S is not about anything, and hence not about the king of France.
Therefore 4. Since S is significant, there must in some sense exist the king of France.
But 5. In no sense does the king of France (the round square) exist.

Hence supposition 1. is mistaken. Hence too "the king of France" is not a constituent of S when S is correctly analysed.

B. Suppose 1. Then 2.
Also 6. As S is significant, it either is true or false.
By 2, 7. S is true if the king of France is wise, and false if the king of France is not wise.
But 8. The proposition that the king of France is wise and the proposition that he is not wise are alike true only if there exists something which is the king of France.

From 6, 7 and 8, 4 follows, so it is argued. Thus, as before, supposition 1 is mistaken.

In argument A, quite apart from dubious premisses and ambiguities in words like "analysed", equivocations are made on the words "about" and "anything". "Anything" in 3 is ambiguous between "anything actual", in which case the first clauses of 3 are not inconsistent with 2, and "any item", in which case the second part of 3 does not follow from the first. In the sense of "about" in which 2 is true a subject-predicate sentence is *about* the subject item, and the item need not be an entity. But in the sense of "about" in which 3 is true a subject-predicate sentence may only be *about* an actual subject-item. Once this equivocation is removed, 2 and 3 are not inconsistent, so 4 does not follow. Independent arguments against 4 have already been adduced (in §2).

Argument B also fails to establish that supposition 1 is mistaken, even conceding premiss 6. For 8 is false, by the independence principle. The wise king of France is wise, even if the wise king of France does not exist. In contrast, the proposition that (the king of France)^{E} is wise, where the superscripting shows existential loading, is true only if there exists something which is the king of France. But under this construal which

guarantees 8, 7 is false. For then "(the king of France)^{E} is wise" is true if both the king of France is wise and the king of France exists, and it is false if either the king of France is not wise *or* the king of France does not exist. Finally if "the king of France" were replaced throughout 8 by "(the king of France)^{E}" and 7 amended then 4 would not follow. Moreover with or without the replacement, 4 is clearly false (see also Strawson, OR; and Slog, chapters 3 and 7).

Once these arguments are undercut there is nothing to stop us reverting to what even Russell thinks is the obvious account of such sentences as

(16) The round square does not exist;

namely, as attributing the property of not existing to the round square, or as denying the existence of the item, the round square. Russell's contention (PM, p. 66) is that (16) cannot be regarded

> as denying the existence of a certain object called "the round square". For if there were such an object, it would exist: we cannot first assume that there is a certain object and then proceed to deny that there is such an object.

This argument, from negative existentials, fails, as we have observed, once set outside the restrictive assumptions of the Reference Theory. For "object" cannot be read "entity", since it is wrong to construe (16) as denying the existence of an *entity*, the round square. But unless "object" is read "entity", it does not follow from the fact that object a does not exist that object a does exist (Ontological Assumption application) or that there exists an object that does not exist (Existential Generalisation).

Certainly if there were^{E} exactly one round square, the round square would exist. But if some item is (=) the round square, it does not follow that the round square exists. So in denying the existence of such an item as the round square one does not first (have to) assume that it exists. Hence there is no pressure to analyse sentences containing descriptions which denote nothing actual so that the descriptions vanish. Definite and indefinite descriptions do not have to be construed as incomplete symbols, but may instead be admitted as primitive expressions.

Summing up, Russell has established neither that descriptions cannot be taken as values of variables, nor that descriptions lack both sense and reference and have no

meaning in isolation, nor that descriptions can only be defined contextually. Thus the main pressure to eliminate descriptions, by analysing expressions in which they occur, is removed, and the main motivation for Russell's theory thereby destroyed. More generally, there do not seem to be any a priori objections to constructing theories which

(ai) admit definite and indefinite descriptions as values of variables;

(aii) do not define descriptions contextually, but take at least some sorts of descriptions as primitive well-formed terms; and

(aiii) do not provide, or admit generally, an eliminative analysis (or "theory" in a narrow sense) of descriptions, but take them as more or less in logical order as they are.

Such theories can be consistently designed, and have much to recommend them. They are naturally geared to a neutral logic, since many of the objects descriptions designate do not exist; they stand a vastly better chance than standard theories of assigning the intuitively right truth-values to sentences in which descriptions occur since inflexible eliminations are not obligatory; they can bring out the crucial cases of Meinong's truth-value assignments; and they offer the prospect of more satisfactory intensional logics. Furthermore independent considerations support (ai)–(aiii) as correct. For instance, such implications as "Everything is red or not red implies that Pegasus is red or Pegasus is not red", "Every item is self-identical implies that a round square is identical with a round square" do have initial intuitive appeal as correct implications. If subject variables *do* hold places for all subjects there is nothing to stop us giving them such a range, and excellent reasons in a neutral logic for giving them such a range (see Slog, chapter 3) – then "Pegasus" and "the round square" will be among the substitution values of the variables. Given such variable values the implications cited are correct, simply by instantiation. Given such a variable range more restricted variable ranges can be introduced as well. Thus adopting, as we shall, very wide subject variable-ranges has the added advantage of giving the theory greater generality as compared with classical theories like Russell's. Finally, in defence of (ai), descriptions are admitted all the time as replacement values of variables in philosophical and mathematical arguments, without any evidence that Russell's and Hilbert's existential and other requirements on introduction of descriptions are met.

Given (ai), (aii) appears essential if the introduction of descriptions of all sorts is not to result in inconsistency; and given (ai), (aii) can certainly be guaranteed, even if it

does not prove the most economical course. Defence of (aiii) is more difficult. Because of the sheer diversity of predicates, any contextual definition of descriptions seems bound to give the wrong value assignments for some classes of predicates; and all the more immediate, and so far proposed, contextual definitions do so fail, (see further chapter 4 [reprinted in Vol. 2 *—Eds.*]). It is argued subsequently (in chapter 8 [reprinted in Vol. 3 *—Eds.*]) that all such contextual definitions do fail and that an adequate eliminative analysis is impossible. Similarly, as earlier remarked, the usual alternative to (aii) of starting with existentially loaded expressions and then introducing by definition expressions which do not carry such ontological loading, ontologically neutral expressions, appears to be impossible, if it is to be achieved without prejudging and assessing wrongly the content-values of many expressions. And it is certainly not possible to eliminate ontological commitment in a contextual theory of definite descriptions set within classical logic. For ontological commitment is not eliminated but merely transferred to quantifiers. Under Russell's theory, for example, descriptions and also quantifiers are ultimately explained, from a substitutional view point, in terms of logically proper names, and these names carry by their very definition existential loading.

Since proper names and descriptions are to be admitted as substitution-values of variables, the grammatical predicates "exists" and "is possible" should be admitted as values of predicate parameters. For one wants to be able to formalise and to represent in arguments such significant sentences as "Pegasus does not exist, but is possible". It follows then that "a exists", where "a" is a proper name, is significant. Russell, however, contends – what seems patently false – that "a exists" and "a is unreal" are meaningless; that

> it is only of descriptions – definite and indefinite – that existence can be significantly asserted; for if "a" is a name, it *must* name something: what does not name anything is not a name ... (MP, p. 23).

He claims that

> it is only where a propositional function comes in that existence may be significantly asserted. You can assert "The so-and-so exists", meaning that there is just one c which has these properties, but when you get hold of a c that has them, you cannot say of that c that it exists, because that is nonsense (PLA, p. 252).

These points are hardly conclusive. Even granted a name must name some item, it does not follow that the item must be actual. "Santa Claus" and "Vulcan" are names, though admittedly logically improper ones. Thus it is false that "what does not name anything^{E}" is not a name. Moreover even if an entity a is right in front of one, it still seems significant to say "a exists" or "this exists". That such a claim is unusual and often pointless does not imply that it is non-significant; and it may not always be pointless; consider "See, Santa Claus does exist", "Look, this exists, contrary to what you asserted". Moreover, in order for "this exists" to be tautologous, as is sometimes erroneously claimed, or contextually self-vindicating, the sentence must be significant. Further, many items that can be ostensively named can also be described.[1] Suppose for instance that

$$a = \text{ the item which has } \Phi \quad \text{(e.g. which is } a\text{)}$$

Then Russell admits that "the item which has Φ exists" is significant. But isn't the predicate "exists" transparent? So doesn't it follow, first, from "the item which has Φ exists" that "a exists", and, secondly (in a similar way, or from the first inference and its converse), from the significance claim that "a exists" is significant. But Russell would reject these very plausible arguments and various related arguments (see PLA, p. 233) on the ground that only of propositional functions can existence be asserted or denied significantly. Since the previous points seemed to show that this is not so, what is Russell's case? Russell compares "exists" with the non-distributive predicate "is numerous". But the analogy breaks down; for example, the sentence "the author of *Waverley* no longer exists" is significant, even on Russell's theory, but "the author of *Waverley* is no longer numerous" is not; and the inference "Men exist; Strawson is a man; therefore Strawson exists" even if incorrect (replace "Strawson" by "James Bond") has some appeal and is not nonsense like the inference "Men are numerous; Strawson is a man; therefore Strawson is numerous". In fact the existence of a plurality, or natural manifold, is a matter of the existence of its elements, whereas its numerousness is not; blue whales exist only if some members of the manifold of blue whales exist, whereas blue whales are numerous only if the manifold has many members. So it is (as it should be) significant to speak of the existence of individual members of manifolds and classes, and why should not

[1] On Russell's theory this is true for ordinary proper names which are really concealed descriptions, but as regards logically proper names Russell would deny it. The separation is enforced by a sharp distinction between acquaintance and description, and a corresponding epistemic distinction between knowledge by acquaintance and knowledge by description. But neither distinction stands up to too much examination; and though divisions can be made the requisite sharpness of the divisions is an illusion.

these belong to various classes, e.g. to the class of prophets?[1] As against Russell (PLA, p. 234), it seems that existence propositions like "Moses exists" *do* say something about the individual Moses, and not simply about the class (propositional function) whose sole member (value) is Moses.

Russell's theory of descriptions, like its classically based rivals, immerses one in platonism. For in order to argue about any definite (or indefinite) item in detail using Russell's logic one must assign properties to that item: otherwise one will not be able to apply the predicate logic. But if any properties are assigned to items, then according to the theory that item exists. Since mathematical objects have properties, they all exist. Not surprisingly classical logic commits adherents, who almost invariably wish to retain much of mathematics, to the existence of abstract sets and transfinite numbers, and to the galaxy of entities of platonistic mathematics. For these theories of course embody the Ontological Assumption (as formulated, e.g. in proposition *14.21 of PM). By contrast, the theory of objects leads to none of these ontological excesses. Mathematical objects, for example, do not exist; mathematics is an existence-free science (see p. 38).

It is astonishing, then, that it is Meinong who is so frequently accused of ontological extravagance, and nowadays not uncommonly associated with Descartes' notorious ontological proof of the existence of God. As regards ontological commitments, so also as regards ontological proofs, it is the reductionist opposition to Meinong, not Meinong, that has the excessive existential commitments. The extent to which philosophical myth has entirely reversed the true situation will emerge from an examination of the leading modern alternative to Russell's theory of descriptions.

§13. The Sixth Way: Quine's proof that God exists.

The traditional arguments for the existence of God, for instance, the famous Five Ways of St. Thomas Aquinas, were not intended to show that the God whose existence was proved had all the properties normally expected of him,[2] and the arguments on some occasions attributed some rather surprising features to the Deity, e.g. that all sewers and compost boxes were part of him. It is the same, as we shall very shortly see, with the

[1] It is a major weakness of Russell's proposed definition of *class existence* that "exists" does not distribute. Once nonentities are admitted, one has, on Russell's definition, such ludicrous results as that the class consisting of Pegasus, Santa Claus and Quine exists.

[2] As Hospers: remarks of the Causal Argument (Hospers 1956, p. 327).

Third Way, which will henceforth serve as a model. And it is the same with the modern argument which follows; once again, the argument itself is not any the worse for that: it will simply have to be supplemented by additional arguments designed to adduce other expected features.

Aquinas's Third Way is supposed to establish the existence of a First Cause, which is then identified with God. Until recently, modern philosophican gospel had it that the argument to the First Cause was unsound, suffering from manifold deficiencies. It is now known that the argument can be made mathematically rather more respectable, though of course not assumptionless, by appeal to the Axiom of Choice. The folkloric argument (which I learnt from Meyer, who said that it had come down to him from Putnam, who said ... Alfarabi) is in essence as follows: Consider the set E of (sometime actual) events. It is certainly non-null and it is particularly ordered by the effect-cause relation. Now consider an arbitrary chain (i.e. totally ordered subset) in E. By essentially Aquinas's argument this must have an upper bound. Hence, by Zorn's lemma, E has a maximal element; but as maximal this element has no causal predecessor, and is accordingly a First Cause. Though the argument proves more than just a First Cause (e.g. by symmetry it equally proves that there exists a Final Effect), it does not of course without much further ado establish the other expected properties of God, e.g., most important, that God is First Cause, or that God is worship-worthy – nor was it intended to or pretended to by its advocates.

Given the argument the proposition that God exists is, in fact, equivalent to the Axiom of Choice, using expected connections. For the Axiom of Choice materially implies Zorn's lemma, which materially implies that God exists, given that God is a First Cause. And conversely, that God exists materially implies that a supreme choice maker exists (given such expected properties of God as omnipotence), so the Axiom of Choice is guaranteed.

Accordingly it may be considered something of a virtue (for once) of Quine's set theory ML (of ML) that it fails the Axiom of Choice (no First Cause in this way for Quineans unless E should turn out to be Cantorean). There is however no such escape

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A preliminary caution about the argument: If it establishes the existence of a Deity, it establishes nothing whatever about the Deity's characteristics except the characteristic of being the Cause of the universe.

from theism for MLers: for there is a Sixth Way, unknown to Aquinas, which establishes, using just the logical apparatus furnished in ML, that God exists. Once again, although the argument does show that MLers are committed to the existence of God, the argument does not pretend to show that the God shown to exist has other expected properties of the deity: these have to be argued for somewhat independently – insofar as they can be.

There is a further virtue of the ML argument: unlike the rehashed Third Way, it is classically valid. Those accustomed to the ways of Zorn's lemma will have observed that (unfortunately?) the argument bogs down where applications of Zorn's lemma frequently encounter trouble (fortunately for its integrity), namely in showing that every chain of E has an upper bound. A well-publicised objection to the Causal Argument is precisely to the effect that not every chain is bounded above.

To descend to mundane details: Quine (in ML, p. 150) tries to escape a serious dilemma, that of either admitting that "God" and "Pegasus" both exist or of banishing such names from logical discourse, by introducing "God" and "Pegasus" as abbreviations of "$(\imath x)$ god x" ("the God") and "$(\imath x)$ peg x". The escape is illusory. As regards the God, there are just two cases: Either the uniqueness condition $(\exists y)(x)(x = y \equiv .\ \text{god}\ x)$ is satisfied, and the main tenet of monotheism holds; or else the uniqueness condition fails and, by ML *197 (ML, p. 148).

(1) $(\imath x)$ god $x = \Lambda$ i.e. the x such that x godizes is the same as the null set.

But it follows very simply from (1), using well-advertised principles maintained by Quine, that the God does exist; and accordingly, given Quine's contentions, the main tenet of theism, that God exists, holds.

There are many routes to the damaging conclusion:

(i) Λ is the value of a bound (existential) variable; see, e.g., the proof of ML, †240.

(ii) To exist is to be the value of a bound (existential) variable (see the statement in Carnap MN, p. 42 and references given there, and also WO, p. 242). Hence, by (i) and (ii),

(iii) Λ exists.

(iii) may alternatively be derived as follows: Since $\Lambda = \Lambda$, by ML, *231 and †182,

(iv) $(\exists z)(z = \Lambda\ )$ by *232. But (iv) is equivalent to (iii) (as Quine concedes WO, pp. 176–179). Further

(v) "Exists" is a referentially transparent predicate, since, e.g., the predicate "exists" is true of everything (ML, p. 150, WO, p. 176). Alternatively, (v) follows from the theorem $x = y \supset . (\exists z)(z = x) \supset (\exists z)(z = y)$, using the equivalence, x exists $\equiv (\exists y)(y = x)$, already noted under (iv). (This equivalence must hold, even though Quine excludes "exists" from the formalism of ML, since both predicates are said to be true of everything.) Finally from (iii) and (v),

(vi) $((\imath x)$ god $x)$ exists.

Alternatively from (iv), by *223 and (1), or directly from (1) by *232,

(vii) $(\exists z)(z = (\imath x)$ god $x)$;

and as before (vii) guarantees (vi). Thus the God exists in the one and only sense of "exists" that Quine will really tolerate (see, e.g., WO, p. 241–2). Similarly for nonentities such as the Pegasizer: attempts to deny their existence in the applied system ML force the admission of their existence. Quine seems to have got entangled in Plato's beard.

Some features of Quinean deism are easily adducible. In particular, the deism is a monodeism. Further, it is a very hospitable religion, in an odd way; for everything that is in the ordinary way said not to exist, Pegasus, Sherlock Holmes, all the gods of the Greek pantheon, are one with God (at least if the religion is approached from the "atheistic" direction). Actually, the doctrine admits of improvement,[1] so that, among other things, the excessive and heretical hospitality is removed. Replace (1) by

(1′) $(\imath x)$ god $x = V$;

God coincides with the universe of everything that exists. The damaging result that God = Sherlock Holmes is removed, since $\Lambda \neq V$; and a pleasant pantheism emerges. For "God is everything and everything God" (OED definition of "pantheism"). Each of us relates to God, by being an element, and also a part, of God; and so on. Nor is it difficult to see that God may be considered an object of awe and worship-worthy,[2] since he is the totality of all that exists, the sun and all it illuminates, the firmament of stars.

[1] Such improvements a Quinean can hardly resist; for what happens to definite descriptions when the uniqueness clause fails is accounted a Don't Care. So why not make the inevitable deism more attractive? God's position, as near to the Absolute as we can attain in Quinean theory, is unfortunately somewhat insecure, since the theory may well be inconsistent.

[2] Similarly perhaps when (l) is adopted in ZF set theory, the null set, as furnishing the effective universe of modern set theory and as enabling the construction of all numbers may even be reckoned worship-worthy.

The objection is quite general. Analogous objections work against any other "queer-entity" theories of description, i.e. against method IIIB of Carnap (MN, p. 36). The argument applies against any theory of descriptions which has descriptions which do not satisfy the unique existence clause, designate some existent object(s), where a transparent existent predicate is definable. So the objection applies not just to Quine (in ML) but to Frege, Martin, Carnap (see references in MN), Scott, Kalish and Montague 1964 and others. Consider *any* description "$(\imath x)kx$", where "k" is an extensional predicate and $(\imath x)kx$ does not exist. Then Carnap's and Martin's theories of definite descriptions (both discussed in MN, circa p. 36) lead to the obnoxious result even for internal existence brinkmanship – that $(\imath x)kx$ does exist. For example, Carnap claims as an advantage of his method, what is a disadvantage of Russell's method (MN, p. 34), that the inferences of "specification and existential generalisation are ... valid also for descriptions (at least in extensional contexts)" (MN, p. 35). But given these inferences it follows from the reflexivity of identity (MN, p. 14), in turn:

(a) $(\imath x)kx = (\imath x)kx$

(b) $(\exists y)(y = (\imath x)kx)$.

Even if the warrant to move to (b) by existential generalisation were withdrawn, (a) certainly holds on Carnap's theory: this follows from 8–1 (MN, p. 37) and from $a^* = a^*$, a consequence of the reflexivity of identity of the null entity, since "a^*" is an individual constant. Now analyse the left-hand description of (a) according to MN 8–1 and use the fact that $(\imath x)kx$ does not satisfy the uniqueness requirement: then

(c) $a^* = (\imath x)kx$

(c) may alternatively be established by *reductio* from the supposition that $\sim$(c). Similarly the uniqueness of a^* follows. Applying these results, the obnoxious (b) and

(b′) $(\exists!y)(y = (\imath x)kx)$

follow. Any item $(\imath x)kx$ which does not exist, exists – internally – after all! Yet, according to Kalish and Montague 1964, p. 234,

> In the case of *improper* definite descriptions, that is expressions of the form [the object α such that ϕ] for which either no object or more than one object satisfy ϕ, ordinary usage provides no guidance; it therefore falls to us to specify this meaning. It is convenient to select

> a common designation for all improper definite descriptions. What object we choose for this purpose is unimportant, but for the sake of definiteness, let us choose the number 0,

one of Frege's choices. Their statement reveals a marked insensitivity to ordinary usage.[1] For the theory verifies not merely what are ordinarily considered gross falsehoods but also category mistakes, e.g. "Sherlock Holmes is a number", "all fictional objects are numbers" (and, conversely presumably, natural numbers are fictional objects being successors of 0 which is a fictional object), "The king of France is less than 1" (p. 235), and "The king of France multiplied by 12 is Sherlock Holmes". Likewise the idea that "it falls to us to specify the meaning" of nonreferring descriptions is entirely mistaken; and so is the idea that the choice of designation is a matter of convenience. For both conflict with much hard data, such as that fictional objects are mostly not sets, not numbers, and do not exist.

The general moral is that no Fregean-style theory of descriptions which sends all descriptions which are about nothing existent to some (allegedly) existent object can be other than a travesty. There is only one way out of the difficulty on this style of theory, and that is to introduce a null item, a^* say, which does *not* exist. But if *one* such item were introduced into the theory (in defiance of the Reference Theory and especially of classical quantification principles), why not introduce *several*? For this would resolve other potent difficulties of the theories, such as that God and Pegasus are not identical and not generally believed to be identical?

For a very serious defect of Fregean-style theories is abysmal performance in intensional sentence contexts. People's beliefs, thoughts and attitudes towards particular gods or unicorns or attributes are not beliefs, thoughts and attitudes towards the null set (or whatever replaces it, e.g. 0, the null entity, the non-self-identical).[2] This is of course realised by most exponents of such theories, who restrict their theories, in one way or another, to extensional languages (e.g. Kalish and Montague 1964, p. 116). But then *no* account of the logical behaviour of descriptions in intensional sentence frames remains. That is, such theories so restricted are radically incomplete, in a way that Russell's theory at least is not.

[1] An insensitivity already evident earlier in their book, e.g. in the treatment of "if".

[2] A similar objection will be lodged in the next section against Lambert and van Fraassen's free description logic Lambert and van Fraassen 1967.

A more sophisticated approach than the Kalish–Montague procedure of excluding intensional discourse, is to admit the discourse but under such restrictions, on normal and legitimate logical operations, that its intensionality cannot emerge. That is, the discourse is effectively extensionalised. Consider statements such as "Charlie is thinking about a winged horse". Here the neo-Russellian no-analysis "solution" consists in extracting the subject "Charlie" and treating the remainder as an unanalysable predicate, and forbidding the extraction of "a winged horse" as a proper term in addition to "Charlie" (cf. Quine WO). The advantage of this is that it enables one to assign to such statements the truth-value true if one is so inclined. But this advantage is bought at a heavy price. For first, since one cannot treat such statements as genuinely relational, one is deprived of the usual semantical explanation for their truth. Secondly, one needs to be able to treat the statement as relational and extract the nonreferring term as a proper subject in order to preserve apparently general transformations which convert subject-predicate statements to relational ones, e.g. xf iff $x =$ a y which fs, and in order to carry out many normal logical operations with the statement and to formalise and assess arguments in which it appears. Similarly one needs to treat the predicate as a predicate of the nonreferring term in order to allow for attribution of both it and some (other) extensional predicate to the same subject, as in "The present king of France does not exist but he is thought to by some people", where the whole point is to attribute both properties to the one item, the king of France. In short, although one is able to retain in this fashion pre-analytic truth-value assignments for some such statements, doing so depends upon cutting such statements offfrom normal uses and transformations, and hence depriving them of most of their logical power.

§14. A brief critique of some more recent accounts of proper names and descriptions: free description theories, rigid designators, and causal theories of proper names; and clearing the way for a commonsense neutral account.

The decided unsatisfactoriness of *all* the standard theories of descriptions[1] has not passed unnoticed, and free logicians have been at work trying to design more adequate theories.[2] It is not difficult to see that some of the worst difficulties of classical description theory can be avoided in a free logic setting. For consider a described object a that does not exist, e.g. the Greek god Apollo. Then a can be allowed to be a term of free quantification theory, so for example $a = a$, without a's existence, as represented by $(\exists z)(z = a)$, automatically following by Existential Generalisation. As EG is modified in free logic to FEG, a's existence would only follow given the further assumption (which does not hold) that a exists, i.e. aE. Accordingly too, free logic can satisfy some of the desiderata (ai)–(aiii) already presented for a satisfactory theory of descriptions, without yielding unwarranted existence claims. For example, free description theories characteristically take descriptions as primitive terms, which are substitution values for *free* variables. There is no need to reduce these descriptions to quantified expressions, and in general free logic descriptions are not so eliminable, in terms of quantifiers. The limitations to free variables, coupled with the existential qualifications on particularisation and instantiation,

[1] That is, to be more specific, all the theories considered in MN, p. 32 ff , and minor variations thereupon. It is worth recalling how old most of these theories now are; the main theories, those of Frege and Russell, go back more than 70 years.

A useful addition to Carnap's telling criticism (in MN) of the third theory, that of Hilbert–Bernays, may be found in Scott 1967, pp. 181–2.

[2] They have been at work for at least four decades. The history of free logic and free description theory apparently has not been documented, but some of the antecedents are clear enough. The distinctive theses of free logic may be found in Moore, and indeed are implicit much earlier, e.g. in Mill's work. For example in 1927 Moore wrote (Moore 1959, p. 87; see also p. 88):

> I entirely deny that fa *is* entailed by "for all x, fx"; fa is entailed by the conjunction "for all x, fx" and "a exists".

That Moore took quantifiers as existentially-loaded is evident not only from this passage but from many other places in his work (e.g., Moore 1959, p. 118). Modern symbolic free logic is often said to begin with Leonard 1956, where important principles of free logic and free description theory are studied. The modern subject began to flourish about the early Sixties: See especially Hintikka 1959, Leblanc and Hailperin 1959 and Lambert, e.g. Lambert 1963. Smiley's 1959–60, although it really involves a many-valued many-sorted theory, is in the same tradition, the *broader free logic tradition* that uses (and usually is prepared to use only) existentially-restricted quantifiers and accepts the thesis that everything exists and Quine's criterion for ontological commitment. Earlier nonclassical work outside that tradition includes Lejewski 1954–55 and Rescher 1959.

means, however, that *there are severe limitations on the amount of information concerning described items that do not exist that can be logically assessed in free logic.* Thus, for example, the main system of free logic studied in Lambert and van Fraassen 1972, the system FD, called the minimal *free* description theory, gives *no* information (other than that supplied by quantification logic with identity) as to *any* described items that do not exist. The reason is simply explained and worth explaining. A free description theory results upon adding definite descriptions as terms to free quantification logic with identity,[1] and subjecting the new terms to certain axiomatic conditions. *Minimal* free description theory FD (of Lambert and van Fraassen 1972, p. 206) is characterised by the *basic scheme*

(FDL) $(\forall y)(y = \imath x A(x) \equiv .\ A(y)\ \&\ (\forall z)(A(z) \supset .\ y = z))$.[2]

When $\imath x A(x)$ exists, by free logic instantiation, since $\imath x A(x) = \imath x A(x)$ always, $A(\imath x A(x))$ and also $(\forall z)(A(z) \supset .\ \imath x A(x) = z)$, thus giving fundamental principles of standard description theory. Specifically, FDL yields the following familiar scheme where $\imath x A$ exists, i.e. $(\exists y)(y = \imath x A)$:

CD. $B(\imath x A) \equiv (\exists y)((\forall x)(x = y \equiv .\ A)\ \&\ B(y))$.

Proof is, in outline, as follows (use of specific constants is readily eliminated by way of generalisation and distribution of $\exists$). Suppose, firstly, $B(\imath x A)$. Since $(\imath x A)E$, by FDL, as before, $(\forall z)(A(z) \equiv .\ \imath x A = z)$. Hence existentially generalising on $\imath x A$ and changing bound variables, $(\exists y)((\forall x)(x = y \equiv A)\ \&\ B(y))$. Suppose, conversely, that there exists a y such that $(\forall x)(x = y \equiv A)$ and $B(y)$. By the first, since $(\imath x A)E$, $\imath x A = y \equiv A(\imath x A)$. But by FDL, $A(\imath x A)$ so, $\imath x A = y$. Hence, by IIA, $B(\imath x A)$. CD is regularly taken as a common denominator of theories of descriptions, as a principle any decent theory of descriptions would satisfy. Likewise FDL, whence CD derives, is often taken as completely solid, as impervious to criticism. Not so, in either case. For the principles, applied generally, assume, what is false,

[1] As in the classical case (cf. §11) the identity theory customarily adopted requires modification: see the discussion of assumption (1) just below.

[2] Strictly, with y not free in $A(x)$.

(1) All descriptions are Leibnitzian, i.e. for every existing y, if $y = \imath x A$ and $B(y)$ then $B(\imath x A)$;

(2) The definite descriptor $\imath$ (read "the"), is always existentially loaded, i.e. *the* is the^{E}, *the existing*;

(3) Definite descriptions (where well-behaved) meet a strong uniqueness requirement.

The assumptions will appear quite explicitly when we come (in §22) to proving the basic scheme FDL in neutral logic; but that they are tacit assumptions of free logic (as almost always presented) is readily brought out. Assumption (1) has already been used in deriving CD: if the identity determinate of CD is extensional identity – as it would be if everyday and everyday philosophical purposes were being taken into serious account – then (1) is subject to the proviso: provided B is an extensional frame. Even if (as so often in logic and philosophy, to their detriment) the model is pure mathematics, where the usual identity determinate is strict identity, the qualifications, provided B is a strict frame, would be required. Otherwise the scheme CD, which includes no scoping provisions, would let through intensional paradoxes (as indicated in §11).[1]

In accordance with the (misguided) guiding principle of free logic, that bound individual variables should range only over a given domain of entities (Scott's principle in Scott 1967, p. 183), the free logic descriptor "$\imath$" which always (by the formation rules and accompanying definition of bound variables) binds variables, is existentially restricted. That is, assumption (2) is an integral part of free logic. But many natural language definite descriptions do not conform to the assumption, e.g. "the thing a fears most", "the object of her desires", and (though more controversially) "the least rapidly convergent sequence", "the round square" and "the detective Conan Doyle wrote about" (the fuller case is a repeat of that of §4). Hence assumption (2) is, like assumption (1), false.

The uniqueness assumption (3) is not confined to free logic theories, but is shared with standard theories such as Russell's. The issue is best approached through the fol-

[1] Subsequently, in §22, it will emerge that not only B but A in both CD and FDL should be subject to an extensional restriction. Lambert and van Fraassen, later in Lambert and van Fraassen 1972, p. 215, do reformulate their identity theory to permit replacement only in atomic wff, a procedure equivalent in logical results to the extensional identity theory of EI (see footnote 12 thereof). However this is not good enough: it should also be required, as at least a tacit interpretational condition, that all atomic parameters are extensional. Otherwise faulty replacements can be carried through using atomic wff.

lowing immediate consequences of FDL:

$(\exists y)(y = \imath x A) \equiv (\exists y)(A \,\&\, (\forall z)(A \supset .\ y = z))$, from FDL distributing $\exists$.

Hence since $zE \equiv (\exists y)(y = z)$ and (using IIA) $A(y) \equiv (\forall z)(y = z \supset .\ A(z))$;

EU. $\quad (\imath x A)E \equiv (\exists! y)A$,

where the existential uniqueness quantifier, $\exists!$, is defined $(\exists! y)A =_{\mathrm{Df}} (\exists y)(\forall x)(x = y \equiv .\ A)$, with the uniqueness defined over entities, i.e. y is unique among what exists. Scheme EU corresponds exactly to one of Russell's two definitions, namely PM, *14.02. Thus the two basic principles of Russell's theory are both represented, even in minimal free description theory, by EU and CD; but CD, which is scope-free and existence-qualified is substantially weaker than *14.01 of PM. The main reason for going, for having to go, beyond the minimal free theory is to try to make up some of the difference. In view of the correspondence, some of the criticism made of Russell's theory (in §12) transfers to free description theory, as for instance any criticism based on EU. An important criticism of Russell's theory, and of all theories of definite descriptions so far worked out, is that the uniqueness requirement imposed (for example in CD and EU) is too strong, that natural language definite descriptions do not conform to such a requirement. Consider the remark:

(a) The red-headed man is gorging himself on meat pies.

The statement may well be true, despite the fact that more than one entity is a red-headed man. It is enough that one red-headed man is indicated in the context of (a) and that that man is gorging himself on meat pies. The uniqueness requirement of CD is too strong. Similarly EU is countered by such remarks as (b) below –

(b) The red-headed man (still) exists,

said, for instance by crooks or secret service agents who thought the man was dead. The truth of (b) does not imply that there exists uniquely a red-headed man, so EU is also false when applied to natural language descriptions. Thus uncontroversial as EU is among logicians, it is falsified as soon as it is applied to real-life examples, which do not require strong uniqueness. To be sure one can define a logicians' *the* which satisfies the strong uniqueness condition, just as one can define a material conditional, and it is useful

to do so. But natural language definite descriptions diverge in their behaviour from the logicians' contrivance. Uniqueness is not a matter of uniqueness with respect to every entity in the world, as with the material *the* but a contextually determined matter. It is enough in the case of (a) that in the class determined by the context of (a) at most one element is a red-headed man. The requisite point has been noticed, though in a quite different setting, by Strawson:

> For him [the speaker] to be referring to just one particular, it is not enough that there should be at least one particular which his description fits. There must be *at most* one such particular *which he has in mind* (Strawson 1959, pp. 182–3).

The intentional element may be taken up contextually (see §22).

The conclusion reached is that free description theory is not adequate to handle descriptive discourse about what does exist. Insofar as it accommodates discourse about what does not exist, the situation is even worse. In the minimal theory, detachment is precluded, when $\imath x A(x)$ does not exist, so no properties can be assigned to $\imath x A(x)$ using FDL. (Nor are we given counter-factual information in the way Lambert–van Fraassen tend to suggest, p. 206; for the conditional is material, so all that scheme FDL yields is the form, $\sim(\imath x A(x))E \vee \ldots$, which is immediate independently from $\sim(\imath x A(x))E$.)

Nor can the free logic theory of nondesignating descriptions be satisfactorily rectified, because free logic provides no ways of talking generally about what does not exist. A basic problem, that is, with free description theory derives from the inexistential inadequacy of its underlying quantificational logic. The problem is thus not avoided by strengthening minimal free description theory, though plainly, there are ways of strengthening the theory. In fact those that have so far been offered are of comparatively little merit in the enterprise of formalising the logic of discourse about what does not exist, and also reveal how little help free logic is going to be in the elaboration of existence-free formalisations of mathematics and theoretical sciences. Consider, for instance, the "strong" theory FD2 (of Lambert and van Fraassen 1967, sketched in Lambert and van Fraassen 1972, pp. 201–2) which results from FD by addition of the nonentity collapsing postulate

F2. $\quad t_1 = t_2 \equiv (\forall y)(y = t_1 \equiv .\ y = t_2)$,

i.e. objects are identical iff(materially) they are identical to the same entities. Since nonentities are never identical with entities it follows that they are all identical; there is just one nonentity, a^*, say, which can be taken as $\imath x(x \neq x)$. Thus the round square, the golden mountain and Apollo are all one and the same, and they are identical with each of the numbers. The identification of all nonentities, "which may be both perfectly harmless and very useful in some contexts" (Lambert and van Fraassen 1972, p. 202), renders the theory rather worthless for philosophical purposes and decidedly harmful for existence-free mathematics. Furthermore, FD2 fails in intensional applications. For it yields essentially *Carnap's scheme* (MN, p. 37):

$$B(\imath xA(x)) \equiv (\exists y)((\forall x)(A(x) \equiv .\ x = y)\ \&\ B(y)) \vee \sim(\exists y)(\forall x)(A(x) \equiv .\ x = y)\ \&\ B(a^*).$$

Now take $B(\ )$ as "Routley believes that ... is distinct from a^*", with $a^* = \imath x(x \neq x)$, and $\imath xA(x)$ as "the winged horse Pegasus". Since the winged horse Pegasus does not exist, it follows:

> Routley believes that Pegasus is distinct from a^* iffRoutley believes that a^* is distinct from a^*,

which is false.[1]

The free description theory of Scott 1967 – which illustrates well both the limitations and strength of free logic description theory and how rectifying it leads beyond free logic – is at the same time faulted. For Scott's theory of descriptions is effectively equivalent – as a theory of descriptions, not as a theory of terms – to theory FD2;[2] in

[1] In fact, minimal free logic FD (of Lambert and van Fraassen 1972, p. 157 ff .) also fails in intensional settings but the failure may be ascribed to the presence of a full indiscernibility principle in the underlying identity logic, a principle Lambert–van Fraassen subsequently remove in part.

[2] Scott's system differs from FD2 in lacking constants and only containing a single two-place predicate. This difference is unimportant: constants and a full set of predicate symbols are readily added to the system without essential variation in the logic; call the result of such additions SS. The logic of SS is quantified free logic with Leibnitz identity together with the following two schemes for descriptions (rewritten, for the purposes of comparison, in the notation of the text):

I1. $(\forall y)(y = \imath xA \equiv .\ (\forall x)(x = y \equiv .\ A))$, with y not free in A;

I2. $\sim(\exists y)(y = \imath xA) \supset .\ a^* = \imath xA$, where a^* (Scott's *) is defined as for FD2.

I1 just is the basic scheme FDL. In order to prove the effective equivalence of the theories of descriptions of FD2 and SS, it remains to show – since the underlying free logics are the same – that I2 is tantamount to F2 in the case of descriptive terms.

ad I2, given FD2. Since $(\forall y)(y = y)$, $\sim(\exists y)(y \neq y)$. By FDL, $(\exists y)(y = \imath xA) \supset (\exists y)A$, so $(\exists y)(y = a^*) \supset (\exists y)(y \neq y)$. Hence $\sim(\exists y)(y = a^*)$, i.e. $\sim E!a^*$. But by F2, $\sim E!t\ \&\ \sim E!t' \supset .\ t = t'$ (see Lambert and van Fraassen 1972, p. 202), whence $\sim E!\imath xA \supset .\ a^* = \imath xA$, i.e. I2.

both theories so-called proper descriptions, i.e. those where an existentially unique entity satisfies the descriptive phrase, are (by FDL) precisely those descriptions whose values exist, and all remaining improper descriptions are identified with a^* (and assigned, on Scott's theory, the null entity). Thus Scott's theory yields both Carnap's scheme, the nonentity collapsing scheme F2 for descriptions, and other disasters.

According to Scott (1967, p. 187)

> one important reason for insisting that improper descriptions all assume the same improper value is to have this highly useful law of extensionality:
>
> $\vDash (\forall x)(A \equiv B) \supset .\ \imath x A = \imath x B$
>
> This would not be valid if one wanted "the golden mountain" and "the round square" to have different values. While making unkind remarks about "the golden mountain", Russell also rejected this law of extensionality, which this author considers an unfortunate choice.

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ad F2 for descriptions, given SS. Firstly for any terms t_1 and t_2, $t_1 = t_2 \supset (\forall y)(y = t_1 \equiv .\ y = t_2)$ in SS, by applying Scott's UG to transitivity of identity. For the converse half of F2 suppose $(\forall y)(y = t_1 \equiv .\ y = t_2)$; to show, where t_1 and t_2 are descriptions, $t_1 = t_2$. There are 3 cases.

Case 1. $E!t_1$, i.e. $(\exists z)(z = t_1)$. Then by Scott's UI, i.e. existence restricted instantiation, $t_1 = t_1 \equiv .\ t_1 = t_2$, whence $t_1 = t_2$.

Case 2. $E!t_2$. Similar to case 1.

Case 3. $\sim E!t_1$ & $\sim E!t_2$. In this case, and this case only, the assumption that t_1 and t_2 are descriptions *is* required. Then by I2, $a^* = t_1$ & $a^* = t_2$, so $t_1 = t_2$.

It is evident that Scott's system could be improved upon (even allowing for the faulty framework within which it is set) and thereby rendered equivalent to FD2 by strengthening I2 to

I2′. $\sim E!t \supset .\ a^* = t$

For then the missing case 3 goes through without the assumption that the terms involved are descriptions. System SS gives a separate role to descriptions which do not refer, a role that may also be taken however by other singular terms, which may be said simply to stand in for descriptions, e.g. "Pegasus" for "the pegasiser". The anomaly is removed by the strengthening. It thereby becomes evident also that what is missing from Scott's system is the principle, connecting terms and descriptions,

TD. $t = \imath x(x = t)$ –

in cases where neither t nor $\imath x(x = t)$ exists. There are again 3 cases to consider:

Case 1. $E!t$. Then by I1, taking A as $x = t$, $t = \imath x(x = t) \equiv (\forall t)(x = t \equiv .\ x = t)$, whence TD.

Case 2. $E!\imath x(x = t)$. By I1 again, using the existence-restricted CP, $A(\imath x A)$, $\imath x(x = t) = t$.

Case 3. $\sim E!t$ & $\sim E!\imath x(x = t)$. By I2 and I2′, $t = a^* = \imath x(x = t)$.

Hence TD is a theorem of FD2; but it is not valid for SS, a further black mark against SS.

Russell was right of course. Scott's theory fails badly on intensional discourse, but not merely there. The golden mountain and the round square are not identical, since one is golden and a mountain and the other not, but $(\forall x)(x$ is a golden mountain $\equiv$ x is a round square) is vacuously true;[1] hence the extensionality principle is false. That it identifies all nonentities is the most serious error in this principle's ways, but not the only one: it also identifies all analytically described objects, e.g. $\imath x(x = x)$ and $\imath x(xE \vee {\sim}xE)$, and all impossibly described objects, e.g. $\imath x(x \neq x)$ and $\imath x({\sim}xr \,\&\, xr)$. For the purposes of assessing intensional or inexistential reasoning the principle is obviously hopeless. There are also then, as usual, two ways of repairing the extensionality principle, both of which require substantial enlargement of free logic, and the second of which means transgressing free logic motivational principles. The first is to strengthen the biconditional in the antecedent, not just to strict strength but to coentailment strength; the second is to expand the range of the quantifier to encompass nonentities. The two ways can be independently pursued (as the separation of recent work on entailment from that on the theory of objects indicates), but in a really satisfactory theory the two ways would be fused.

The second way, the important way for a theory of objects, Lambert fails to discern when he considers (in Lambert 1976, p. 252) how a self-respecting Meinongian would repair the following neutral variant on the principle of extensionality:

IP*. $\qquad (Ux)(A!x \equiv B!x) \equiv .\ \imath yA(y) = \imath yB(y),$

where $A!x =_{\mathrm{Df}} A(x) \,\&\, (Uz)(A(z) \supset .\ z = x)$, which Lambert contends

> at least purports to be a standard discriminating a particular *kind* of entity, viz. object a. Unfortunately, though it can be consistently conjoined with the key theses of Meinong's theory, it limits impossible objects to one. (p. 252)

Although the limitation, to one nonentity, does follow when IP* is *re*written with existentially-loaded quantifiers, it does *not* follow when the principle is expressed neutrally (but Lambert's intended reading is neutral: see Lambert 1974, p. 311). For consider the (pure) round square and the (pure) golden mountain; the first is round and is square, the second golden and a mountain, and that is all (Parsons' model Parsons 1974 furnishes such pure

[1] Provided, we count out such mountains as Mont D'Or in New Caledonia.

objects). Since the (pure) round square is actually round and square but the (pure) golden mountain is not round and square, by IP*, the (pure) round square ≠ the (pure) golden mountain. In short, IP* itself – like a neutralised principle of extensionality, $(Ux)(A \equiv B) \supset .\ \imath xA = \imath xB$ – will serve (within wide limits) for an extensional theory of objects. Lambert, observing only the first intensional way of repairing extensionality principles, wonders whether a theory of impossible objects is inevitably intensional?[1] The answer is No. But much of the point of a theory of objects would be removed by restricting it to the extensional.

What is true of the golden mountain differs from what is true of the round square and that from what is true of the number 11 or the Euclidean triangle. In order to account semantically for these differences it is enough to refrain from identifying the objects outside the entity domain with a^*, to avoid Scott's mistake. But going that far, giving more than one nonentity a role in the semantical analysis, is to begin on an appealing slippery slope that leads beyond the confines of free logic. For then there will be a set of nonentities, so a domain of them might as well be included in the semantic modelling, and it will be tempting to generalise and particularise about them at least in the metalanguage – but then why not in the object language also? In fact Scott is already prepared to quantify over a^* in his set-theoretic metalanguage;[2] and nothing stops us in taking this language as an object language in more comprehensive investigations.

The conclusion we can now step to, is this: Just as it is essential to proceed beyond free quantificational logic to neutral logic, so it is essential to go beyond free description theory. Can much be salvaged from free description theory? Abandoning nonentity collapsing postulates such as F2 and I2 is certainly essential. Principle FDL, i.e. Scott's I1, can however be retained, subject to due qualification (see points (1)–(3) above). Moreover some correct principles can be gleaned from FDL by using the translation of free logic into neutral logic, e.g. the existence-qualified Characterisation Principle,

[1] What Lambert in fact says is: "It would be a valuable philosophical discovery to be shown that the aversion to impossible objects goes hand in hand with the aversion to intensions". Would it? The aversions are not constantly conjoined, an aversion to impossible objects not materially implying an aversion to intensions. And while all past and present philosophers with an aversion to intensions do appear to have had an aversion to impossible objects, the connection is merely accidental. It is not too difficult to envisage an extensional philosopher equipped with a rudimentary theory of objects which he peddles: with very little adjustment some of Lesniewski's disciples would fill the bill.

[2] See the suggestions for interpreting a^*, e.g. as the set of all sets belonging to A which are non-self-members, p. 184. An appeal to the difference assumed between sets and individuals would not evade the general point for long.

$(\imath xA)E \supset A(\imath xA)$. But can minimal free description theory be extended to the theory of objects, as Lambert has suggested (in Lambert 1974), by rewriting FDL with neutral operators to yield a neutral description theory? Definitely not. For *one* thing, neutralised FDL delivers at once, since $\imath xA = \imath xA$, $A(\imath xA)$, i.e. the unrestricted Characterisation Principle, and therefore engenders inconsistency and triviality. This is hardly, what Lambert tries to make out it is, a problem, since there is no good reason to suppose that neutralised IP is valid,[1] and good reason to think that it is incorrect. Insofar as a neutral description theory is required – even when the reductionist pressures underlying usual demands for quantificational elimination of descriptions have been neutralised a residue theory is still required, e.g. to undertake the sort of work IP* attempts to do – neutralised FDL is a bad direction in which to seek such a theory. Neutral logic can indicate a much better direction. A key question is this (cf. Lambert's question, Lambert 1974, p. 311): which object does a description $\imath xA(x)$ select. If some object a satisfies $A(x)$ and just one object in the indicated context satisfies $A(x)$, then in the given context $\imath xA(x)$ picks out that object a (i.e., in effect, a qualified neutral version of the nondamaging half of IP is validated). Since the need for scoping has been removed (along with the Reference Theory), the one problem remaining, which parallels the problem of choice of a standard theory of descriptions, is to determine whether $\imath xA(x)$ selects an object and, if it does, what it selects when the conditions are not satisfied. There are many options, among which leaving things unspecified or undefined is a poor one logically (for reasons of Carnap and Scott already alluded to) and linguistically. But for the present it can be left open how the choice is to be made (the issue is taken up again in §22, where a fairly natural choice is made, and investigated). What is important for the present negatively-oriented discussion is that a description is like a proper name in making a contextually-controlled selection, but the selection is also governed by properties given in the description.

While the experimental theories of descriptions of the free logicians have had comparatively little impact and have certainly not supplanted Russell's theory, the new theories of proper names have had substantial coverage in the philosophical press and are widely thought to have superseded Russell's theory of logically proper names. In part, however, the impression of supersession is wishful thinking; it is just that few are prepared to return to logically proper names,[2] and thence to logical atomism – though that

[1] See the argument of Routley 1976.

[2] There are isolated exceptions: Prior was one (e.g. Prior 1962), Cresswell 1973 may be another.

is where classical logic leads. The idea that it does not has been gained by compartmentalisation, by setting aside more highly intensional discourse as too hard, for a later stage, to be handled differently (e.g., as epistemic), etc.

The main new theory of proper names, centered on the causal theory (also called "the historical explanation view" and "the genetic view"), has various forms, the forms varying with the authorship, and the authorship being drawn from an all-star American cast including Kaplan, Kripke, Putnam, Donnellan, Vendler, and others. But whatever the form the theory takes, it is supposed to supplement classical logical theory, perhaps combined with modalities, by a theory of *ordinary* proper names. The causal theory – set within the framework of the Reference Theory and its associated logics, classical logic and essentialist modal extensions thereof – is intended to provide an alternative theory of (proper) names, to graft onto the (modally enlarged) classical scheme of things, not just to Russell's theory, but to Frege's and to the theories proposed by their successors, such as Wittgenstein and Searle. The theory is intended to give an account, firstly, of what distinguishes ordinary proper names from other singular terms, and, secondly, of the semantic role of these proper names, in particular, how their reference is determined, a question to be answered partly in terms of their historical genesis. But the causal theory as commonly presented is not merely set within the framework of the Reference Theory, rather (so it will become apparent) it incorporates the main assumptions of that Theory, and thus becomes an obstacle to any theory of objects; and insofar as it cannot be freed from these assumptions it will have to be discarded. (This is not to exclude other grounds for discarding, or modifying, the theory.) But, as it happens, Kripke's causal theory, in contrast to some of the other causal theories, is readily freed from referential assumptions, and could, in modified form, be combined with a theory of objects. The causal theory, although a central part of the new accounts of proper names, is by no means the whole story that is told; the causal theory is surrounded by other theories designed to protect it or supplement it, e.g. theories of rigid designators, and theories of various sorts of names, such as genuine names, vivid names, empty names and even general names. It will pay to pick offsome of the surrounding defence before assaulting the causal theory.

The Reference Theory underlies almost all modern accounts of proper names and of reference, and so its removal does extensive damage to those accounts. For example, with its rejection most recent accounts – and not merely those of or associated with causal theories – of what distinguishes names, *genuine proper* names, from other (singular)

subjects fall. Firstly, the idea that such names are exclusively replacement values of variables in quantification logic is wrong, since descriptions and other terms are also legitimate replacements. Similarly defective is the thesis[1] of Quine (1970, p. 27) that

> What distinguishes a name is that it can stand coherently in the place of a variable, in predication, and will yield true results when used to instantiate true universal quantifications.

If the variables and quantifiers are those of neutral logic, then the situation is as before: descriptions become, on this account, what they are usually not, names. But if the variables and quantifiers are those of classical logic, those of Quine's regimented canonical language, then names are referential and many ordinary names are excluded.[2] Thus all names of what does not exist, or may not exist, are ruled out as names, e.g. Pegasus, Vulcan, Homer. And if Quine's transparency requirements are taken seriously we are back on the royal route to logically proper names.

Kripke's thesis (in e.g., Kripke 1972, p. 270) that ordinary proper names are rigid designators but descriptions are commonly not, does not serve to distinguish proper names from descriptions, since many descriptions are rigid designators. It does propose a necessary condition on proper names, however, one which is liable to put an investigation of proper names on the wrong track. The same holds for the reformalisation of the thesis in a way independent of the apparatus of possible worlds, as in Peacocke 1975. Kripke's thesis makes use of the technical term "rigid designator" which is explained by Kripke thus (Kripke 1972, p. 269): "Let's call something a rigid designator if in any possible world it designates the same object". Elsewhere Kripke (e.g. Kripke 1971) explains the notion more carefully thus: a rigid designator is a term which stands for the same object in every world in which it has designation at all. The more careful explanation looks as if it (properly) admits "Chiron" and "Pegasus" as proper names, if those terms stood for objects in Kripke worlds: this would set the account apart from Peacocke's reconstruction of Kripke where ordinary names of nonentities are excluded from among *genuine* names. But this is not the case: Kripke's quantifiers are referential, his objects, like Peacocke's,

[1] Endorsed in Peacocke 1975, p. 126, and underlying the alternative Kripkean account of names in terms of rigid designators given therein.

[2] Much the same goes for Anscombe's point (in Anscombe 1958) that the distinction feature of a proper name is that it contributes to the meaning of a sentence precisely by standing for its bearer. If "standing for its bearer" is construed widely, so do other terms such as descriptions; but if it is construed narrowly many proper names are ruled out.

transparent entities. On Kripke's view (cf. Kripke 1973, p. 6) it is logically necessary that everything exists; so there are no possible worlds where a centaur exists or Chiron exists – else it would be possible that some centaur exists, conflicting with Kripke's assertion (Kripke 1972, pp. 252–4; also Kripke 1973) that it is not the case that there might have been centaurs (or unicorns). The first account of rigid designator would make everything named by a rigid designator a necessary existent, contradicting Kripke's claim (in Kripke 1973). But the second account lets through as rigid designators a host of terms that vacuously satisfy the condition, e.g. all names and descriptions of impossible objects; and this would do much damage to other Kripkean views, as will be explained during a detour where some of these views are criticised. A repair which does accord with the Kripkean picture is as follows: a rigid designator is a term which designates the same entity in every possible world in which it has a designation and which has a designation in some possible world. The "repair" appears however to rule out proper names such as "Sherlock Holmes", so-called "empty names"; and in any case it will not save the question-begging notion of rigid designator.

The underlying Kripkean picture – in *no way* obligatory upon those who undertake modal logic semantics, who have other much more satisfactory pictures than either Kripke's or Lewis's open to them[1] – is that the union of the domain of possible worlds consists entirely of entities, and that no domain of a world ever contains a nonentity as an element (i.e. the actual world T controls world domains). Hence, among other things (see especially Kripke 1973), the thesis $\Box(x)xE$,[2] and the consequent surprises – mistakes – about Sherlock Holmes and unicorns, e.g. that it is false that Sherlock Holmes might have existed. For the proper name "Sherlock Holmes" being, since a name, a rigid designator, would have to designate the same entity in every world; but in no Kripke world can it designate an entity without wrongly designating that entity in the actual world where it has no designation; so in no Kripke world does Sherlock Holmes exist, and therefore it is

[1] The other options include, firstly, worlds semantics which, unlike the Kripke and Lewis options, reject the Reference Theory, and secondly, semantics which eschew worlds, e.g. functional semantics like those of Loparić 1977 and Routley and Loparić 1978.

[2] Whether the free logic thesis $\Box(x)xE$ is true or not depends upon how the quantifier "for every" is interpreted. If it is construed neutrally or in possibility terms then the thesis is of course false since many objects do not exist. If however it is construed existentially, as, for "every existing", then the thesis is true, since it amounts to $\Box(Ux)(xE \supset xE)$, which is logically true.

The truth $\Box(\forall x)xE$ should not be confused, as is often pointed out in discussions of Barcan formulae, with the falsehood $(\forall x)\Box xE$. The latter says that whatever exists necessarily exists, i.e. $(Ux)(xE \supset \Box xE)$.

not possible that he exists. Kripke's earlier view (in Kripke 1963) – though it included the thesis $\Box(x)xE$, amounting as it did to an S5 modalisation of free logic – was not so restrictive: "Sherlock Holmes" could

> name a possible fictional [object] who doesn't exist in this world [according to Kripke 1963] ... [But now I hold] this view is false (Kripke 1973, p. 11).

Kripke's new interpretational impositions (for which no argument is offered, Kripke simply operating within the framework of these assumptions) have no basis in modal theory, as Kripke's earlier work shows. Though ill-founded, the imports are not arbitrary, but are the result of enforcing the Reference Theory, and withdrawing the limited interpretation concessions free logic allows towards nonreferential discourse (e.g. outer domains of nonentities for each world).

The Kripkean picture is thoroughly referential: not only are existence assumptions built in, e.g. through the existential restrictions on objects and the composition of domains just remarked, and, the source of these, the Ontological Assumption accepted;[1] full indiscernibility, like Russell's theory of descriptions, also goes unquestioned, in par-

[1] The Ontological Assumption is a pervasive background assumption in Kripke's theorising, which is occasionally spotlighted, especially in the lectures entitled "Empty Reference" (Kripke 1973) and what is said there concerning fictional characters. As a first example, consider statements ordinarily accounted true about nonentities, such as "Pegasus is a flying horse", "The Greeks worshipped Zeus" and "This literary critic admires Desdemona". According to Kripke,

> The only way to get a grip on this sort of discourse is to ascribe to ordinary language an ontology of fictional characters. This ... is just a feature of ordinary language. The fictional characters whom one must suppose to exist aren't Meinongian half-entities; they are abstract entities ... (Kripke 1973, p. 14).

The point is not merely that this is false, in a serious way, statement-by-statement – though it is – but that Kripke has assumed that in the sense in which fictional statements are true they must be about what exists, i.e. he has automatically applied the Ontological Assumption, and taken it to be, what it is not, a feature of ordinary language. Incidentally, the jibes in Kripke 1973 about Meinongian half entities and twilight entities indicate his failure to think outside the Ontological Assumption.

The second example derives from Kripke's "tentative solution" to a problem he of course gets stuck with, negative existentials, how he can truly say that fictional characters do not exist, having rashly allowed that fictional characters do exist. Kripke's proposal is, where a is a fictional character, that "a is not ϕ" should be more carefully expressed as "There is no true proposition that a is ϕ":

> the predicate "... exists" will be a limiting case: "SH doesn't exist" becomes "There is no true proposition that SH exists". Why is there no true proposition? Because SH doesn't exist (Kripke 1973, p. 17).

The point is not just that this does not resolve the inconsistency or resolve the problem, given that Sherlock Holmes is an abstract entity with contingent properties including that of existing, and not just that the equivalences do not hold (since, e.g. "SH doesn't exist" is a perfectly respectable proposition), but again that blatant use has been made of the Ontological Assumption; it is assumed that because a does not exist there are no true statements about a, no true statements of the form "a is not ϕ".

ticular all identity statements are necessarily true if true at all.[1] A basic trouble, then, with Kripke's theory, is that it scarcely touches the deeper troubles with classical logical theory. For the modal extensions of classical logic do not seriously affect the classical referential picture given that some essentialism is thrown in, all identities are treated as logically necessary when true, names designate none but entities and subjects generally behave referentially, and possible worlds are construed conventionalistically as merely stipulated. In this respect modality is to modern logical theory as weak welfarism of the Welfare State is to modern capitalism – the established doctrine can make minor concessions which are not seen as a threat to the basic structure and can coopt what looked like challenges to its position.

Referential identity assumptions lie behind (what will be considered in reverse order) the causal theory of proper names, the theory of rigid designators, and modern revelations about personal identity – such as, "No one else could have been Moses" (Kripke 1972, also, p. 3) and "One cannot imagine Robert Graves born as Claudius or Sigrid

[1] Both the full assumption and the special case Kripke tries to insist upon, $(x)(y)(x = y \supset .\ \Box(x = y))$, have been criticised in detail in §11. But it is worth considering one further argument (due in essentials to V. Routley) against the special case, namely that combined with reasonable assumptions it implies the Leibnitzian thesis that *all true statements are necessarily true*, a thesis that is false since many true statements are contingent. The argument is as follows

1. Every statement (since expressible by a declarative sentence) may be represented in subject-predicate form. There are two parts to this claim: (a) that every declarative sentence can be so expressed, which is really enough for the very damaging result, and (b) that every statement can be expressed by such a sentence. Part of the case for (b), which is threatened by the possibility of inexpressible statements, may be found in NNL. Claim (a) is argued for in Slog, chapter 3, along the following lines: From every declarative sentence a subject can be extracted, the remainder being a predicate. For example, a relational sentence, aRb, may be expressed in the form, af.
2. By a basic transformation from the theory of indefinite descriptions, af iff, as a matter of necessity, a is identical with a thing which is f, i.e. in symbols, $\Box(af \equiv .\ a = (\kappa y)yf)$. In fact this assumption is classically provable; for classically (e.g. in Russell's theory) $a = (\kappa y)yf$ iff $(\exists z)(a = z\ \&\ zf)$, and $\vdash (\exists z)(a = z\ \&\ af) \equiv af$.

Now suppose A is a true statement. Then by (1), A is of the form af, so af is true. Hence by (2) $a = (\kappa y)yf$. So instantiating the special case, $\Box(a = (\kappa y)yf)$, whence by (2) again $\Box af$, and by (1) again, A is a necessarily true statement.

It may be objected that the instantiation of the special case used is not legitimate. But isn't it? For if af is true, then by referential assumptions a exists, and since aE by transparency $((\kappa y)yf)E$. So free logic conditions for instantiation are met. Thus too Kripke could hardly push this objection very hard given his working modal theory (that of Kripke 1963).

Indeed given an S5 modal logic (which Kripke rightly accepts for logical necessity) the oft-scorned thesis of traditional rationalism, that no *statements are contingent*, is derivable. It remains to show (given LEM) that every false statement is necessarily false. Suppose A is false. Thus af is false, so $a \neq (\kappa y)yf$. But, by S5 principles, $\vdash (x, y)(x \neq y \supset .\ \Box(x \neq y))$. So instantiating (for a free logic proof the further assumption, aE, is required, and the rationalist thesis is accordingly weakened), $\Box(a \neq \kappa y)yf)$, whence $\Box{\sim}af$, and A is necessarily false.

Undset living in the Fourteenth Century" (Vendler 1976, p. 112). Vendler's argument (which extends Kripke's case) is as simple as its premisses are false:

(1) Statements of nonidentity, if true, are necessarily true (Vendler 1976, p. 113) .

Thus since Graves is distinct from Claudius, he is necessarily distinct from Claudius, i.e. it is (logically) impossible that Graves is identical with Claudius. (In symbols, $x \neq y \supset \Box(x \neq y)$, but by Leibnitz's Lie and S5 principles, $\Box(x \neq y) \equiv \sim\Diamond(x = y)$, so $x \neq y \supset \sim\Diamond(x = y)$.)

(2) The impossible cannot be imagined (Vendler 1976, p. 112).

Hence, one cannot imagine Graves identical with Claudius or born as Claudius. In place of such carefully selected examples, other examples which count against the thesis should be considered. For example it is perfectly possible for someone who does not know that George Eliot is Mary Ann Evans to imagine or suppose that George Eliot is not Mary Ann Evans but is in fact George Lewes, or for someone to imagine or assume that Vulcan is distinct from Hephaestus or Hercules from Heracles.

Both premisses of Vendler's argument are false;[1] but it is enough to reject (as was already done in §11) premiss (1), which does quite enough damage on its own. For example, premiss (1) yields at once Kripke's remarkable claim. For the claim is: for no^{E} x distinct from Moses is it possible that x was Moses, i.e. "regimenting", $(\forall x)(x \neq \text{Moses} \supset . \sim\Diamond(x = \text{Moses}))$, which follows immediately from (1), since Moses exists according to Kripke (see Kripke 1973).

With the removal of this argument an elaborate structure Vendler erects (in Vendler 1976) upon it, using the circumstances the argument is supposed to establish, is demolished; in particular, his recreation of the transcendent self, and (with modifications) of the Cartesian cogito, collapses.[2] For example, the key statement "I am z" (e.g.

[1] Counterexamples to premiss (2) and detailed criticism of the premiss may be found in Routley[2] 1975, and centuries earlier, in a splendid passage in Reid 1895, p. 376 ff ..

[2] It is scarcely to the point to document this. But it is important to glimpse the way in which speculative metaphysics may be based on elementary logical principles, often of a referential cast. In this connection it is worth remarking that Vendler's argument is heavily referential, relying not only on the special cases of IIA, but on applications of OA. For instance, he contends, what is essential to his case.

> the nonexistence of ... the thinking, conscious thing as such ... is indeed unthinkable, since that very thought, as any thought, implies its existence (p. 117, my rearrangement).

Not so: thinking objects, such as various heathen gods, do not exist.

"I am Zeno Vendler") can revert to being what Vendler says it looks like but can hardly be, an identity statement; for its truth does not entail that it is necessarily true; it is an extensional identity, its truth depending on its context.

Vendler in fact appeals to Kripke's rigid designator theory to bolster the crucial premiss that identity statements are noncontingent: the procedure is circular, since (as will shortly appear) rigid designator theory in its turn depends on principles like (1). It is not surprising that rigid designation theory can reinforce claims like (1) when it depends on them.

It is assumed in the requirement of sameness of designations from world to world used in the characterisation of rigid designation, that the identity notion is necessary identity. Indeed Kripke can discern no criterion of identity other than necessary identity: contingent identity he rules out, and it is unremarkable that his account of theoretical identity in terms of rigid designators excludes it, since necessary identity is presupposed at the base of the account of rigid designators. For suppose extensional identity is the test. Then every singular term that designates (or on a different approach, none) can be a rigid designator; simply let it designate what it is about, i.e. $I(t, a) = I(t) = t$. For instance, "the president of USA in 1970" refers in each world to Preso, i.e. the president of USA in 1970. Why not? With extensional identity, Kripke's argument that (some) descriptions are not rigid designators breaks down. The argument is simply this (Kripke 1972, p. 270; 1971, p. 144): "The president of US in 1970" designates a certain man, Nixon, but someone else, e.g. Humphrey, might have been president in 1970, i.e. in some possible world the descriptive phrase designates Humphrey, not Nixon. Therefore the descriptive phrase is not rigid, since it designates different entities in different worlds. But does it? On the interpretation given the phrase designates Preso in every possible world. Therefore, since the descriptive phrase "The president of US in 1970" designates the same object Preso, who happens to be the same as Nixon in the real world, and extensionally identical with Humphrey in some other world, the descriptive phrase is a rigid designator. Thus the notion of rigid designator is seriously unstable without something like a preliminary division of terms which name entities and those which do not, that is, without assumption of the very distinction at issue. In an analogous way it can be shown that names such as "Nixon" are not rigid designators. For in the actual world "Nixon" designates Preso but in the world in which Humphrey is president it does not. Similarly for every other name. Again, the notion is unstable (indeed inconsistent),

and removing the instability depends upon already having made a distinction between objects and – what amount, on the standard picture, to – individual concepts.

Peacocke's nonmodal reformulation of the notion of rigid designator may appear to avoid this instability by relativising the notion of rigid designation to languages. It is a matter of appearance only, however, because what is a rigid designator depends not only on the language L but also on what counts as an *object*, on the range of values of variables, and so on; in brief, in Peacocke's philosophical framework, on the metalogic, meta-L, also. According to Peacocke (1975, p. 110),

> t is a rigid designator in L iffthere is an object x such that for any sentence $G(t)$ in which t occurs, the truth (falsity) condition for $G(t)$ is that $\langle x \rangle$ satisfy (respectively, fail to satisfy) $G(\ )$.

Peacocke, aiming to show offthe merits of this account, continues:

> Definite descriptions, in the use of them with which Kripke was concerned when he denied that they are rigid designators, are not rigid designators on this criterion either. There is no object such that the truth-conditions for $G(\text{the } F)$ is that *that object* (or its unit sequence) satisfy $G(\ )$.

It is quite unclear what the qualification on the thesis that definite descriptions are not rigid designators is supposed to be. On Kripke's account some descriptions, e.g. "the square root of 25", are, explicitly, rigid designators (see Kripke 1971, p. 145). Take "the F" in Peacocke's apparently general claim as "the square root of 25"; then there is (on Kripke's view) an object, namely 5, which does what no object is said to do. Peacocke's claim is false, and his Russellian arguments for it invalid. Is Peacocke's claim correct for *some* descriptions? Not without qualifications he does not make. Let language L be an extensional free quantification logic. Then (for a suitable fairly natural choice of metalanguage) it is, as Peacocke himself later remarks (p. 116),

> possible to write out a truth theory ... that evaluates definite descriptions directly (as *terms*), and which contains as theorems sentences of the form $T(G(\imath x)Fx) \equiv \langle (\imath x)Fx \rangle$ sat[isfie]s $G(\xi_1)$,

i.e. *all* descriptions are rigid designators in the language. A similar stunt can be pulled offfor neutral logics. Peacocke sees this as a "problem" and comments that "the appropriateness of such truth theories in this particular area can be rejected only on some

substantive grounds": it will come as no surprise to the reader that these "substantive grounds" turn out to be grounds drawn from the Reference Theory.

The account is unstable, in a like manner, over which proper names (if any) are rigid designators. For example, on Peacocke's intended referential reading of "there is an object", names of nonentities in simplified English will not be rigid designators, but on a neutral reading they can be. The account does not show in an unequivocal way that "proper names are rigid designators in our sense" (p. 111). Nor therefore does the notion of rigid designator offer the precision, explicitness and elucidation claimed for it. There is a case then for saying that "rigid designator" is a piece of technical terminology – perhaps best discarded – which does not do the intended job without taking for granted much that is at issue. A corollary is the undermining of the main applications Kripke makes of rigid designation: especially to contingent identity theories of mental phenomena (e.g. Kripke 1971, p. 161 ff).

Both Kripke and Peacocke take it as a consequence of the view that proper names are rigid designators that proper names (or at least *genuine* proper names) are "essentially scopeless". It is a consequence, however, only given further assumptions, in Peacocke's formulation, as to the coincidence of truth conditions (for, as will emerge, truth conditions can be so stated that proper names do have scopes which make a difference). The question of whether proper names have scope can be, and has been, considered independently. And it may be suggested that scope provides another way of distinguishing genuine proper names: they are those (singular) subjects that are scopeless. But the assumption that proper names are scopeless, essentially the idea that they are transparent in all sentence frames, is entirely mistaken: it involves us in most of the problems of logically proper names over again. Saying that proper names have no scope can be put (as Peacocke notes, p. 112) by saying that they always have maximum scope, and also that they always have minimum scope: scope does not matter or, in Geach's terms (Geach 1972, pp. 117, 140, 144), genuine proper names give no scope trouble. This implies (indeed is virtually tantamount to saying) that such proper names are entirely transparent. For let "a" be such a name, e.g. "Heath" embedded in a frame "$\Phi \ldots f$", e.g. "It might have been the case that ... is not prime minister" to take Peacocke's example. The point of the scopelessness claim is that there is no difference in truth-value, and truth conditions, between

(1) Concerning Heath: It might have been the case that he is not prime minister (or "it is true of Heath that it might ..."), and

(2) It might have been the case that: Heath is not prime minister,

or more generally – extending the notation of PM, *14, with "$[a]$" read "of a" or "concerning a" – between

(1g) $[a]\Psi af$ and

(2g) $\Psi[a]af$.

Now positions of maximum scope are accessible to identity substitution; for the subject is *not* within the scope of an intensional functor. Suppose $a = b$, e.g. Heath = Sir Edward. Then by (1g) and replacement $[b]\Psi bf$. Hence, classically $a = b \supset .\ \Psi[a]af \equiv \Psi[b]bf$, i.e. since scope is immaterial $a = b \supset .\ \Psi af \equiv \Psi bf$ generally. (The converse connection is more complex and depends on the analysis of terms adopted. For example, on Russell's theory where terms other than names are descriptions it can be shown that scope does not matter where the object described exists and the sentence frame is extensional; see PM, *14.3). It is false that all nonquotational sentence contexts are transparent, and also decidedly liberating to abandon the idea that all are or must be analyzed so that they are (see e.g. §11); hence it is false that genuine proper names are scopeless, and also liberating to abandon the idea that scope is immaterial for proper names. For, among other things, it puts an end to the quest for endless searches for what always turns out to be distorting analyses which only work, at best, for a limited range of cases.[1]

[1] For a recent example, see e.g. Peacocke's attempt (Peacocke 1975, p. 126 ff .) to separate in truth-value

(3) John believes that Cicero was bald, and

(4) John believes that Tully was bald,

Since Cicero = Tully, direct application of his theses would make (3) and (4) inseparable. Peacocke's first response is to reject surface structure sentences, and insist upon regimentation of language, as input to a theory of truth. He then proposes use of Davidson's paratactic analysis of (3) (an analysis rejected in chapter 8 below [reprinted in Vol. 3 —*Eds.*]), in an overtly quotational way which brings "Cicero" rather than Cicero into the truth-conditions for (3), with the result that "strictly speaking ... there are no such non-relational propositional attitude sentences [as (3)] containing proper names after all" (p. 128). The example illustrates, as Peacocke concludes (p. 128)

> a general strategy that it is natural for the defender of the view that names are rigid designators to adopt; that is, of explaining any apparent differences in truth-conditions of surface structure sentences differing only in the occurrences of distinct proper names α and β, where α and β denote the same object, by the difference between the *expressions* α and β themselves.

Peacocke has an argument that is worth considering against Dummett's thesis (Dummett 1973, pp. 113–7) that distinctions of scope with respect to operators apply to proper names as much as to definite descriptions.[1] It is that on the scoping position

> there ought to be a true reading of almost any sentence of the form
>
> α might not have been α ... .
>
> Yet there seems to be no such reading of the sentence for genuine proper names. Worse; in many cases, something other than the thing that is in fact α might [do], and so ... it ought (on one reading of the sentence) to be true to say
>
> Something other than the thing that is α might have been α
>
> (Peacocke 1975, p. 113).

Strictly it does follow from the view that *sometimes* scope matters in the case of proper names, that it ever matters in the case of certain contexts, such as the ones cited. However it is not difficult to design cases where it is material even in sentences of the form $\Diamond(\ldots \neq \ldots)$. Consider for example, the true statement

(5) It is true of Mary Brown that she might (easily) not have been Mary Brown,

where the story-teller, after explaining how an unforeseen accident one evening changed the course of events, concludes:

(6) It is true of Mary Jones that she might have been Mary Brown.

Other possible cases with similar outcome are easily devised (reincarnation, which presumably in some forms at least is *logically* possible, serves as a plentiful, if somewhat esoteric, source).

It is an old strategy attempted, for example, in many variations by Carnap; for two such see MN, p. 54 ff . and p. 230ff. Davidson's analysis with Carnap's quotation marks replaced by – what Davidson himself assumes does much the same as quotation – a demonstrative, is simply the latest, clever variation, which does not escape however the old problems for quotational accounts: some of them reappear in the notion of *samesaying*.

But abandon the transparency thesis and such unsatisfactory reductive strategies are rendered unnecessary.

[1] This is not to endorse Dummett's case for his thesis, in particular the contentious claim that there is

> a clear sense in which we may rightly say, "St Anne cannot but have been a parent" (Dummett 1973, p. 113).

The argument for this appears to involve fallacious substitution of an extensional identity in a modal context; it appears to have as premisses "St. Anne is the mother of Mary" and "The mother of Mary cannot but have been a parent".

With the rejection of the thesis that proper names do not really have scope or an equivalent, can go removal of most of the oddities that have emerged from theories of quantified modal logic, e.g. damaging essentialism.

The "scope game" is a technically awkward one carrying many disadvantages (see §12); e.g., even a comparatively simple sentence such as $\Diamond\sim(a = a)$ has (at least) 9 construals, each with a more complicated form, and the number exponentiates as more functors are introduced or are exposed in analysis. Fortunately (as we have already seen, again in §11), the scope game is unnecessary. The need for scoping was forced by the Reference Theory, especially (but not only) the Indiscernibility Assumption; and the game can be abandoned when the Theory is no longer retained. What was achieved by scoping can be better achieved without scoping, both in the case of proper names and in the case of descriptions, by a two-fold procedure

A) the following of natural language in distinguishing syntactic forms that scoping is sometimes said to be necessary to discern, e.g. the syntactic differences between (1) and (2); and

B) the use of neutral logic, in particular the quantification of IIA and of EG. To put it roughly, the proper *consequences* of scoping, that classical logical principles such as EG and IIA fail, are all that are required to maintain the logical benefits of scoping.

Consider, to illustrate, how (1) and (2) are formulated and differentiated. (2) is symbolised in the expected way

(2′) $\Diamond h\sim\text{PM}$

Symbolisation of (1) is less evident, but it is plain that (1) is saying of a thing x which is Heath, that it might have been the case that it, x, is not prime minister; i.e., binding the variable that supplants the pronoun, that, for some x which is Heath, $\Diamond x\sim\text{PM}$. Since existential loading is supplied by the context, (1) may be represented (using classical restricted variables)

(1′) $(\exists x)(x = h \;\&\; \Diamond x\sim\text{PM})$.

(1′) and (2′) are *not* equivalent. (2′) materially implies (1′) since hE and $h = h$; but (1′) does not imply (2′) since $\Diamond\ldots\sim\text{PM}$ is not transparent. The cases where "Heath" is replaced by "the prime minister" are similarly handled; in particular, $(\exists x)(x = \imath\text{PM} \;\&\; \Diamond x\text{PM})$ does not imply $\Diamond\imath\text{PM}$ PM. More generally, (1g) and (2g) become respectively

(with "$P!x$" read "for some one x such that"),

(1g′) $(P!x \ni (x = a))\Psi xf$, and

(2g′) Ψaf.

Rigid designators can be avoided without the artifice of scope; the notion of scoping can be dispensed with along with that of rigid designation. Further, scoping of descriptions can be dispensed with along with that of proper names; indefinite description are handled as for proper names, but for definite descriptions there is the further vexed question of uniqueness to accommodate. It is fairly clear that no impoverishment results from the method; for every scope distinction of Russell's theory can be matched using the method.

Thus far most of the usually discerned differences between proper names and descriptions have been dismissed; for example, descriptions can be replacement values of variables along with proper names, and can conform fully to neutral quantification principles, descriptions can be rigid designators along with proper names, names can be assigned scope along with descriptions, but really the whole artifice of scoping is best, and easily avoided, and so on. To complete the foray on recent referential theories of proper names especially those that seem to stand in the way of any theory of nonexistent objects, it remains to similarly dismiss, or assimilate, the aforementioned causal theory of proper names.

The causal theory – although a recent development and far from clearly articulated or satisfactorily defended – has caught on: it has been easily sold to philosophers rightly dissatisfied with former classical options, and has already been applied (as if it were some sort of received truth) in underpinning facets of the Reference Theory and making trouble for theories of objects. So it is of some importance, in meeting objections to theories of objects, to dispose of or neutralise the causal theory. But it is not so easy to get to grips with theory: as Vendler remarks (in Vendler 1978),

> the causal account, admittedly, is but a cover-story, suggestive and attractive in spite of, perhaps even because of, its vagueness.

Ask a philosopher what the causal theory of reference is and if you succeed in getting an answer it mostly runs something like this: the meaning of a word, or of a name, is given by a causal chain leading from something or other. Firstly, this presupposes an identification of meaning and referring which leading proponents of causal theories

(rightly) do not want to make. Donnellan, for example, explicitly presents his theory as a theory of reference (e.g. Donnellan 1974, p. 3), and so does Kripke who indeed claims, along with Mill, that proper names have no connotation or sense and, against Mill, that neither do general (or class) names (see e.g. Kripke 1972, p. 327). Secondly, Donnellan prefers to avoid the title "causal theory", because he wants "to avoid a seeming commitment to all the links in the referential chain being causal" (Donnellan 1974, p. 3, note 3). The recipe of the explanation theory thus takes the form: *the reference of a (proper) name*, on a given occasion of use, *is determined by* (is a function of) some (explanatory) *chain leading from something* (in the past). So far (at least if "reference" is construed in its nontechnical sense, or replaced by the neutral terms "designation" or "signification"), the theory is quite compatible with a theory of objects. The designations of "Homer" and the designation of "Sherlock Holmes" can both be given in this sort of way: there is an explanatory chain leading from some original sources where the name is introduced to current uses. Similarly, names of nonentities are (as we shall see) admitted, though no doubt unintentionally, under Kripke's account. For proponents of explanation theories – who have given significantly different elaborations of the initial recipe – have usually intended to rule out names of nonentities as fitting under the account they favour. Nowhere is this clearer than with Donnellan, who is in considerable trouble trying to explain how, on his theory, "N does not exist" is true where N is a proper name of a nonentity (even giving him the ill-defined notion of a "block", Donnellan 1974, p. 25, he does not succeed). According to Donnellan's account the chain is one of "historically correct explanation" and the something in the past is an historically existing individual.[1] Thus, for example, the reference of "Socrates" in someone's statement "Socrates is snub-nosed"

[1] Similarly on Kaplan's "genetic" account (in Kaplan 1968–69), explained in Vendler 1978 thus:

> the particular *of* [expressing the identifying relation in phrases of the form "'a' is the name of x"] requires a genetic account causally linking the acquisition of that representation of the individual itself. Thus a child may have a rich vivid "name" of Santa Claus without its being *of* anything,

i.e. anything actual. (Vendler's quantifiers are all referentially-loaded.) But ordinarily, and on the account to be given below, that "a" is the name of x does not entail that x exists; rather that "a" *is* the name of x entails that "a" is about x, i.e., $a = x$ (but *not* conversely). That x does not exist does *not* exclude an explanatory linkage connecting name "a" with x.

The fact of the matter is that both Vendler and Kaplan are, like Donnellan and Kripke and Putnam, locked into (or should it be said, following Armstrong, *humed into*) the Reference Theory. Without, as will become apparent, both the OA and IIA, the main problems causal theories are supposed to solve, and most of the problems they generate, hardly arise.

> is an individual historically related to his use of the name "Socrates" on this occasion (p. 17),

where the "kind of historical connection" is one of (correct) explanation. Where such an individual does not exist there can be no such historical relation (pp. 22–3). Hence Donnellan's problem with negative existentials, and indeed with a great many other commonplace uses of proper names. Is there any good reason why Donnellan's account had to be so narrow, why it cannot be liberalised to admit explanations, for example, of names of nonentities? There is no good reason, as Kripke's account will show, but there is reason of a very familiar sort, namely Donnellan is locked into the Reference Theory. Thus he asserts the Ontological Assumption as if it were entirely uncontroversial (p. 6, note 9): "If Jacob Horn did not exist then there are no true predicative statements to be made about him". His strong commitment to the principle is revealed, rather incidentally, (Donnellan 1974, p. 22), by the extraordinary claim that "in any view we must, I think, accept the following:

E. that Socrates did not exist entails that it is not true that Socrates was snub-nosed".

Certainly on no theory of objects is E accepted, nor would it be ordinarily accepted. Suppose for example, it was discovered that Socrates was not an historical figure, but a fabrication of several Greek authors acting in concert: we don't thereupon strip Socrates of all his features, as the Ontological Assumption would have us do: Socrates remains the Greek philosopher, the main figure of Plato's dialogues, snub-nosed, bald, etc., even though he never did exist. The Indiscernibility Assumption plays an even larger, if more covert rule, in Donnellan's presentation.

The problem the historical explanation theory of ordinary proper names tries to answer only arises within a Leibnitzian setting.[1] The problem is: "How is the referent of a proper name to be determined [... given that not all proper names have] a backing of

[1] The point holds good not merely with respect to Donnellan's motivation, but in the case of variant causal theories as well. Consider, for example, the way Vendler, in Vendler 1978, introduces the causal theory "to account for the identificatory power of certain 'names' ..., including some, or most, singular terms". The problem is: how does "the city I spent last year in", said by Strawson, mean (i.e. in this sense, identify or pick out) Chicago (even for Strawson)? As Vendler remarks, it is surely not a matter of the meaning of the descriptive phrase, nor can it be given by (what is closely related to sense) Leibnitz-identity or by strict identity. But Vendler discerns no identity determinate weaker than strict (as we saw above), so he cannot adopt (and, unsurprisingly, does not even consider) the obvious answer, namely that, in the context specified, the city I spent last year in is contingently identical with Chicago. No causal account is required to explain the matter. An important aspect of the identificatory power of a singular term "a" is that it can be used to *identify*, contingently, in a way that depends on context.

descriptions that serves to pick out this referent?" (Donnellan 1974, p. 14).[1] In setting up the problem in this way, however, equations are made, which, though they hold given full indiscernibility, break down when extensional and intensional identity criteria are properly separated. For example, Donnellan assumes that the thesis that proper names have a backing of descriptions that serve to pick out their references – which is equated with the thesis that "a referent of a proper name is determined by correctly associated descriptions" (p. 14) – is the same as the thesis that "ordinary proper names are like Russell's 'genuine' names at least in so far as they do not conceal descriptions" (p. 14) and that proper names are "by one mechanism or another surrogates for descriptions" (p. 13). Without full indiscernibility, these are rather different theses. For then, where "a" is a proper name and "d" a description, a can be contingently identified with d, without a's being a concealed description of d, i.e. Leibnitz-identical with d, or a surrogate in this sense for d.[2] Nonetheless though a is not a description and in many contexts of its occurrence cannot be replaced by descriptions (i.e. in highly intensional frames), nonetheless "d" or another description can serve to determine the referent of "a"; for this, like identifying reference, is a matter of extensional identity, and statements of such forms as "$a = d$" which are not intensionally embedded suffice to give the referent.

The way Donnellan formulates the problem the historical explanation theory is intended to answer is in fact thoroughly within the confines of the Reference Theory. This is evident from the account he offers of the truth conditions for statements of the form "N is ϕ" where "N" is a name and "ϕ" a predicate.

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[1] The problem is alternatively formulated thus (p. 16):

> But if the principle of identifying descriptions is false, what then is the appropriate relation between an act of using a name and some object such that the name was used to refer to that object?

The conflation of identity criteria is already built into the principle Donnellan is especially concerned to reject (see his Donnell 1972), the principle of *identifying* descriptions.

[2] Similarly, though the story is more complicated, where proper names are logically correlated with sets of descriptions, as on Searle's account, Searle 1958 and 1969; cf. also Wittgenstein 1953, §79. The connection of the object named with what each element of the correlated set is about is one of extensional identity; it is not a Leibnitz-identity nor (differently) are the terms synonymous.

The logical connections made have, then, comparatively little in common with Searle's theory, as exposed and criticised in Kripke 1972. For Searle's theory is thoroughly and objectionably referential. On the ontological front Searle goes so far (in Searle 1969, e.g. p. 77) to impose an axiom of existence, according to which, if an object does not exist, then we cannot, in any good sense, refer to it.

Wittgenstein, despite his opposition to the Referential Theory (though usually in a narrower sense) never completely escaped from the confines of that pernicious theory.

> Putting existence statements aside, ... we can say that in general the truth conditions will have the following form. What the speaker has said will be true if and only if (a) there is some entity related in the appropriate way to his use of "N" in this sentence – that is, he has referred to some entity, and (b) that entity has the property designated ϕ. (I say "in general" because there are di ffi culties for any theory of reference about uses of names for fictional characters, "formal" objects such as numbers, and so forth.)(Donnellan 1974, p. 15)

The Ontological Assumption is thus written into the statement of truth conditions for "N is ϕ", and the result is that the statement has to be hedged around by qualifications strongly reminiscent of those in Russell (e.g. "putting existence statements aside" – but much more has again to be put aside, e.g. all ontic predicates; "in general", because the account fails wherever the Ontological Assumption is countered). But the truth conditions for "N is ϕ" can be stated quite generally, in a way which avoids the Ontological Assumption and thereby avoids the difficulties Donnellan quite mistakenly says there are for *any* theory of reference; namely

> "N is ϕ" is true i ff the item "N" is about has the property $\lambda\phi$.

The problem of finding an entity appropriately related to the use of "N" ("*some* relation between the speech act involving the name 'N' and an object in the world", p. 17) disappears: the historical explanation account becomes otiose. Of course historical explanation remains important in what is different – explaining the origin and history of a name (and what these in turn explain).

The truth conditions have to be (erroneously) contracted to referential ones for the historical explanation theory to have a point or any real chance of success. For

> the central idea is that this [the reference of the subject in "Socrates was snub-nosed"] calls for a historical explanation; we search ... for an individual historically related to his use of the name "Socrates" on this occasion (p. 16).

The central idea is inapplicable to any names but those that refer to individuals that exist or did exist. The intended historical explanation relation, like the causal chain relation, rules out (at least prima facie) all reference to objects that do not yet exist or that never exist. Historical inquiries are not to the point with respect to future objects

(and causation would have to be reversed), and will not reveal any appropriate details of causal chains commencing with the objects that do not exist. For – so it is usually claimed[1] – nonentities cannot occur as elements in causal chains linked to entities; e.g. a is causal ancestor of b and b exists implies that a exists or did exist.[2] Hence the limitation on "genuine" names to suitably referential ones. This unwarranted limitation on names can however be removed, if the restriction, that chains must begin with objects that exist or have existed, is removed. Donnellan provides no serious case for imposing this restriction in the first place, and in fact the restriction is removed on Kripke's account.

A rough statement of Kripke's theory of (proper) names is as follows:

> An initial baptism takes place. Here the object may be named by ostension, or the reference of the name may be fixed by a description (Kripke 1972, p. 302)
> ... or in some other way. ... Subsequent speakers use the name with the intention that it shall have the same reference with which it was originally endowed. Later still yet other speakers pick up the use of the name; and they enlarge it with the intention that it shall have the same reference as it had in the mouths of those from who they learned it. This process continues, and so the use of the name is passed from link to link of a chain of communication: what joins each link to the next is its causal connection with it, together with the persistent intention to use the name with the same reference as the previous speaker (Dummett 1973, pp. 147–8).

There is nothing in this that does not fit names of nonentities as well as names of entities, given that the initial baptism (more precisely, initial *naming*) can be conducted in the absence of the object named, as it can (see Kripke's example of the naming of Neptune, Kripke 1972, notes 33 and 42, and compare it with the naming of Vulcan).[3] Consider the

[1] The claim is appealing as long as one is held captive by a narrow range of models, e.g. of causation as always involving Brentano-style relations. But causation is not so restricted; recall psycho-physical relations and converses, e.g. the thought of seeing Helmut caused her heart to beat faster.

[2] Such conditions are apparently violated on Parsons' theory in Parsons 1974, where it can be true, e.g. that a caused-the-death-of b, b exists and a does not. Parsons would probably say that the conditions hold for relations, whereas the truths his theory admits only ascribe properties.

[3] But various of Kripke's accompanying remarks fail. For example, it is doubtful that "usually a baptizer is acquainted in some sense with the object he names and is able to name it ostensively" (Kripke 1972, p. 349). Just consider a productive novelist.

name "NN" of a character from some work of fiction. The author of the work names the character and fixes the reference (in the colloquial sense) by his work, or he may do so by descriptions. Then use of a name may be passed from speaker to speaker in a chain of communications in exactly the way Dummett has indicated. Whatever the precise linkage is in the case of names of entities it is the same for names of nonentities; for it is with names of objects that have actually been named (whether existent or not) that the account deals, and names of nonentities have the same status as names of entities.[1]

Thus, for what it is worth, Kripke's causal account caters for names of objects which do not exist.[2] A causal theory is no bar to a theory of objects. It is, however, somewhat unclear just what the account is an account of, or, accordingly, what it is worth (cf. Dummett 1973, p. 146, 148). It looks as if it is intended, like other causal theories, as an explication of when a name names, or refers to, or identifies an object (or of when a speaker who uses the name does, or succeeds in doing, these things). But, firstly, that Kripke's account succeeds, looks very doubtful (there is uncertainty because the outline is insufficiently clear at critical points). As Kripke's account stands, it seems, on the one hand, that a name could name an object though not all requirements on linkage are met, and on the other hand, that the conditions of the account can be met without the name naming the given object, e.g. because of unwitting transfer of a reference, because despite intentions, of a misunderstanding (Dummett has a nice example, Dummett 1973, p. 150). Secondly the account is circular; as Kripke points out (Kripke 1972, p. 302) it appeals to the notion of reference at two points in explaining reference.

Once the Reference Theory is seen through there is nothing to stop us reverting to essentially what Donnellan calls the *natural (pretheoretical) view* of singular terms such as ordinary proper names:

> ... prior to theory the natural view is that [such singular terms] occur often in ordinary speech. So if one says, for example "Socrates is snub-nosed" the natural view seems to me to be that the singular expression "Socrates" is simply a device used by the speaker to pick out what he wants to talk about while the rest of the sentence ex-

[1] Just as the causal or historical theory can be redone neutrally, in helping account for the identificatory power of certain singular terms, so recent theories of communication, such as Grice's 1968, can be recast neutrally to allow for communication about objects that do not exist.

[2] Without adjustment of the account in fact given. Of course if someone should try to write more into *baptism* than Kripke does in Kripke 1972, then minor adjustments may be required.

> presses what property he wishes to attribute to that individual. This can be made somewhat more precise by saying, first, that the natural view is that in using such simple sentences containing singular terms we are not saying something general about the world – that is, not saying something that would be correctly analysed with the aid of quantifiers; and, second, that in such cases the speaker could, in all probability, have said the same thing, expressed the same proposition, with the aid of other and different singular expressions, so long as they are being used to refer to the same individual.[1] (Donnellan 1974, p. 11)

Donnellan rejects what he now calls the "natural" view because it generates one of Russell's budget of paradoxes, in fact Russell's puzzle (3): how can a nonentity be the subject of a proposition?[2]

> If I say, "Socrates is snub-nosed", the proposition I express is represented as containing Socrates. If I say, instead, "Jacob Horn does not exist", the "natural" view seems to lead to the unwonted [sic.] conclusion that even if what I say is true, Jacob Horn, though nonexistent, must have some reality. Else what proposition am I expressing? The "natural" view thus seems to land us with the Meinongian population explosion. (p. 12)

This is just the "riddle of non-being" over again: the problem is dissolved (as explained in §4 ff.) with removal of the Ontological Assumption. That a true statement is about Jacob Horn, or that a property such as nonexistence is correctly ascribed to Jacob Horn, does not imply that Jacob Horn has some reality. And the proposition expressed may be represented in the same way Donnellan represents "Socrates is snub-nosed": what parallels $\langle$Socrates, $\lambda x\ x$ is snub-nosed$\rangle$ is $\langle$Jacob Horn, $\lambda x \sim xE\rangle$, which contains Jacob Horn as first component in the same way as the example contains Socrates. As has been said repeatedly (and is said again in a little more detail in chapter 5 [reprinted

[1] But Donnellan's attempt to represent the natural view more formally (pp. 11–12) works not at all unless more fully expressed and then only for elementary sentences.

[2] Donnellan suggests that the natural view generates all of "Russell's budget of paradoxes". But as we have seen, and as is summed up at the end of §22, the natural view generates such puzzles only when combined with the Reference Theory. Abandon the latter theory and the natural view encounters no such puzzles.

in Vol. 2 *—Eds.*], §1) this leads to no population explosion: to suppose that a theory of objects causes a population explosion is to suppose that the objects somehow exist, e.g. have reality. The population explosion metaphor relies upon mistaken referential assumptions.

To elaborate upon the natural view: proper names are *selectors*, they select a single object, a particular, not from the domain of particulars but from a *sub*-class thereof indicated by the context. For example, in the context of Donnellan's paper "Socrates" and "Aristotle" select Greek philosophers, but in another context, e.g. where in a discussion of modern Greek transport it is said "Aristotle sold his airline", "Aristotle" selects not the Philosopher but Aristotle Onassis.

Specifically, for each proper name "a", and indeed for each singular term, occurring in a slab of discourse, the context of its occurrence delimits with more or more often less precision, a class γ_a and a selects, or singles out a particular of γ_a. For instance, in the utterance "Bill can't go out because he hasn't finished his homework" in an obvious context the class consists of members of the immediate family just one of whom is Bill, and in that context "Bill" selects, and signifies, that object. The remainder of the sentence does of course ascribe a property to the object selected, namely the property λx (x can't go out because x hasn't finished x's homework). And the statement expressed is the same as would have been expressed had the speaker ascribed the property to Bill Mathews or to "my son" (the sameness-of-statement relation is that discussed in §12). The account is plainly not limited to objects that now exist or have existed or sometime exist: it applies equally well to proper names that signify objects that never do or never can exist. Thus "Primecharlie" selects, in the context of this book, an impossible object from the class of objects obtained by number-theoretic operations on the natural numbers; "Chiron" in suitable contexts selects an exceptional centaur.

Singular descriptions function in a similar way *except* that characteristically there are *different* constraints on how the selection is made. Consider "the red-headed man" or "the golden mountain". As well as the context, the common terms "red-headed man" and "golden mountain" control the selection, which is, in addition, made differently. For example "the red-headed man" is selected from the restriction of the class of persons in the indicated neighbourhood, i.e. the class indicated by the context, to red-headed male elements. In immediately successful signification, just one object is in the restricted class

and "the red-headed man" selects that object. The selection is not *given in advance* as happens with many proper names. Such descriptors as "a", "an arbitrary", "a certain" similarly differ in how the selection is made from the class marked out by the context and the descriptive phrase.

But really there is no sharp line to be drawn between ordinary proper names and descriptions.[1] The gulf between proper names and descriptions that is an integral part of classical logical theory, and is retained in recent accounts of proper names, is an illusion. Names and descriptions merge into one another, through composite names that have a clear enough sense, such as "The Alpine Way", "The Old Grange", "(The) Treefern Walk", "Tall Trees", "Lyrebird Lookout", "Superman". For example, "The Alpine Way" belongs to the overlap; it is both a name and functions like a definite description of an Australian highcountry road. Many older names retain a descriptive component, e.g. "William of Sherwood", "Peter of Spain" (alternatively "Petrus Hispanicus", which has a fully descriptive construal), and it is well-known that etymologically most names originated as, or abbreviated, descriptions.

Although names merge into descriptions, the ends of the spectrum are very different. To be sure, a subclass of proper names, *pure names*, which have no live descriptive force can be distinguished, along rough syntactical lines as follows: they are not complex expressions like descriptions and contain no descriptive phrases or general terms, but consist of one or more names which do not admit of further syntactical (or semantical) analysis in terms of their parts. Pure names properly include logically proper names. Most ordinary Christian names, for instance, of objects, living or dead, present or future, existent or nonexistent, are pure names, though not logically proper names.

A better distinguishing characteristic for names and descriptions is lack of assumptibility; conventionalised names are no longer assumptible, and their bearers cannot be assumed to have the features the name specifies: Thus Reedy Creek (so called be-

[1] Though various, usually fuzzy but sometimes important, boundaries can be drawn; e.g., between descriptions, descriptive proper names, pure proper names, and variable names.

Corresponding to the gradation of proper names from those which include operational descriptive components to those which are not so composite, is a gradation of names from those with distinctive sense through those with a residue of sense to those with a minimum of sense (obtained, e.g., in virtue of their role as placeholders, which resembles that of constants in logic). The latter type pure proper names which carry no descriptive loading (apart from perhaps an inessential etymological component), might well be called Millian proper names. Mill and Kripke say that these proper names have no connotation or sense; but whether they have some, or zero sense, or a minimal sense, depends on how the theory of sense adopted settles matters in this borderline case.

cause it once had reeds), since it was polluted and subjected to "stream improvement", no longer carries reeds, or indeed any life at all, and even its status as a creek as opposed to a drain is in doubt. Similarly the lyrebirds may long have gone from Lyrebird Lookout, and one cannot safely assume that Bridge St. leads to the bridge (which has been dismantled). Thus unlike the other theories, the theory of objects can explain, through loss of assumptibility such important features of names as their evolution from descriptions, their conventional character, and why conventionalised names are poor in entailments and tend to yield no necessary statement other than such logical ones as self-identity. The spectrum – a spectrum of descriptiveness vs. conventionality – occurs in terms of the *degree* to which the item's name is severed from the item's properties.

But for the theory of objects a fuller-blown theory of proper names is hardly required, and in one respect would be undesirable, in as much as a more specific limiting account would close options for theories of objects that are better left open. It is enough that a range of proper names, including ordinary names of objects that do not exist, can occur as singular terms in the logic, as genuine subjects of true statements. The narrow historical view was an impediment to the satisfactory implementation of this requirement, serving as it did to reinforce the Ontological Assumption: clearing the narrow view out of the way accordingly had some real point. The wider causal theory of names need not conflict, however, with the theory of items, and, for what it is worth, the wider theory can be incorporated into the theory of items. It has, after all, a role in explaining how the selection of object that a name in use makes was originally made, and in this fashion too it can help in determining what the name signifies.

There is no problem in explaining what the reference of a name is, without appeal either to the causal theory or to a notion of sense: the reference of "a", if "a" has a reference, is any entity b, which may be picked out by a description "b", such that $b = a$ (with the identity extensional), and "a" has a reference i ff$(\exists b)(b = a)$, i.e. i ff$a$ exists.[1] But, so it will emerge, reference, like sense is a derivative, not a fundamental, semantical notion. The basic semantical notion is interpretation, which is world and context relativised. The

[1] Reference of a name can be determined without appeal to, or knowledge of sense of the name. Thus Dummett's assertion (Dummett 1973, p. 143) that sense is "the only mechanism by which a name could acquire reference", is just false. Granted the assertion is (analytically) true in *one* of Dummett's idiosyncratic senses of "sense", but these senses, which fail to coincide, diverge rather sharply from the ordinarily understood notions.

interpretation, or signification, of a proper name at a world and in a context is always an object, what in that case the name is about, i.e. what it selects.

IV. Stages of logical reconstruction: evolution of an intensional logic of items, with some applications en route

The approach adopted in the logical development of the theory of items that follows is an evolutionary one. Logical horizons are widened stage by stage in the ascent towards more adequate logics fit for the theory of objects. There are several reasons for this approach. One is to reduce problems so that fewer (parts of) problems need be met at a time, and so that the reasons for meeting them in a given way are better articulated. Another is that *options* are better revealed in this way: there are many degrees (and directions) of departure from orthodoxy where one can rest, with lesser or greater comfort. Yet another is that many details of the latest stages of evolution are not entirely clear (and sometimes, to be honest, far from clear). Things are still being worked out: this is especially so in the higher reaches of relevantly-based intensional logic. But, obviously, once the stages are elaborated and the reasons for advancing from one stage to the next accepted, the logical revolutionary can leap directly to, or beyond, the latest stage.

§15. The initial stage: sentential and zero-order logics.

Classical sentential logic S is correct, for the regimented extensional connectives it includes, for a class of important, classical, contexts: it is not universally correct. It fails, badly (as RLR explains), in nontrivial inconsistent situations (where there are in effect truth-value gluts), and it is in doubt in incomplete situations (where there are truth-value gaps). Nor does it cater for nonsignificance (as Slog explains). However the doubts may be assauged by adjusting the semantics of the logic, e.g. by adopting supervaluational semantics or superior alternatives, and the failures may be avoided by reinterpreting the connectives and restricting the applications of the rules of inference of the logic. Alternatively, but a little less satisfactorily, the application of the logic could be specifically restricted. With these strategies the syntactical structure of logic S remains substantially intact.

The well-formed formulae (wff) of S may be constructed, in accord with usual recursion clauses for connectives, from the following components:

- initial wff $\begin{cases} \text{sentential parameters:} & p, q, r, p', q', r', p'', \ldots \\ \text{sentential constants:} & p_0, q_0, r_0, p_1, \ldots \end{cases}$

- improper symbols (incl. connectives): (,), & ("and"), $\sim$ ("it is not the case that").

Further connectives are defined in familiar fashion (using familiar extrasystemic notation, e.g. that of RLR):

$$A \vee B =_{\text{Df}} \sim(\sim A \,\&\, \sim B); \quad A \supset B =_{\text{Df}} \sim(A \,\&\, \sim B); \quad A \equiv B =_{\text{Df}} (A \supset B) \,\&\, (B \supset A).$$

S may be axiomatised schematically as follows (the bracketing conventions are standard: see, e.g., RLR):

S1. $A \supset . \; A \,\&\, A$ S2. $A \,\&\, B \supset A$

S3. $A \supset B \supset . \; \sim(B \,\&\, C) \supset \sim(C \,\&\, A)$

RMD. Where A and $A \supset B$ are theorems of S so is B, i.e. in symbols: $A, \; A \supset B \rightarrowtail B$ (Material Detachment).

The axiomatisation is essentially that of Rosser 1946. But the rule is an *admissible* rule only; it applies to the theorems of S, but *not* generally, so avoiding the objections (made in RLR) to an unrestricted rule (γ) of Material Detachment. Despite appearances perhaps, the statement of RMD is not circular, for theoremhood may be independently defined, e.g. as follows: A is a *theorem of* S iffin some sequence $A_1, \ldots, A_n$ of wffof S every element A_i $(1 \leq i \leq n)$ is either an instance of schemes S1–S3 or is preceded in the sequence by wffof the form A_h (with $h < i$) and $A_h \supset A_i$, and $A = A_n$.

If the standard two-valued semantics for S is retained then the application of S has to be restricted to exclude nonsignificant assertions (and perhaps incomplete assertions). To explain all this briefly: A *(standard) model* $\underset{\sim}{M}$ for S is a structure $\underset{\sim}{M} = \langle T, I \rangle$ where T is an element (understood as the factual world, or reality) and I is an interpretation function which assigns to each initial wffat T one of the holding values 1 or 0, i.e. $I(A, T) = 1$ or $= 0$, but not both, for each sentential parameter or constant A. The

interpretation is extended from initial wffto all wffby truth-table prescriptions thus:

$$I(A \,\&\, B, T) = 1 \text{ iff } I(A, T) = 1 \text{ and } I(B, T) = 1;$$
$$I(\sim A, T) = 1 \text{ iff } I(A, T) \neq 1.$$

$I(A, T) = 1$ may be read: A *holds at* T, or A is (switched) on at T; or on a different construal of T, as: A is in T. Truth is defined in terms of holding, thus: A is *true in* $\underset{\sim}{M}$ iff $I(A, T) = 1$; and validity is simply truth in every model, i.e. wff A is S-*valid* or classically valid iff A is true in every model $\underset{\sim}{M}$ for S. It is evident that T is otiose and that a model for S can be simplified to an interpretation. The point of introducing T is to prepare the way for the transition to worlds semantics to cater for intensional operators, to bring out the one-world assumption of classical logic, and to introduce, in a preliminary way, the definition of truth which will be adopted, that of truth as holding at T. Familiar arguments show that a wff A is a theorem of S iff A is S-valid. Thus too, a little argument shows, truth-tables provide a decision procedure for S. Accordingly also such principles as LEM, $A \vee \sim A$, and Addition, $A \supset . \; A \vee B$, are theorems of S, since they are valid by truth-tables.

The interpretational troubles begin, of course, with such theorems. If p_0 is a nonsignificant assertion such as "The colour of 5 o'clock is green, not orange" or, more philosophically perplexing, "The duration of 5 o'clock is 10 minutes", then p_0 is neither true nor false, so $p_0 \vee \sim p_0$ fails to be true, and even if A is true $A \vee p_0$ is not. There are two connected ways of dealing with this problem which leave the calculus S unscathed. The first, the falsidal, strategy is to map all elementary nonsignificance into falsehood, i.e. if an *initial* wffsuch as p_0 would intuitively be assigned value nonsignificant then assign the wffthe value false, i.e. 0 at T; and otherwise extend I as before. The falsidal strategy, which has the advantage that the formal semantics is unmodified, runs into interpretational difficulties with natural language negation (as in "The number 7 dislikes dancing" which is just as absurd as "The number 7 likes dancing")[1] and fails to provide a satisfying theory of nonsignificance. (It is, as Slog tries to explain, a strategy for trying to dispose of difficulties without examination, rather than an account of nonsignificance which gets to grips with the preanalytic data.) Also the apparent simplicity of the falsidal mapping vanishes outside artificial languages where the class of atomic wffis not

[1] See Brady and Routley 1973 and Routley 1969.

clearly articulated (because what is primitive and what counts as defined is not effectively determined).

The second strategy, the reinterpretation strategy, reinterprets wffof S over three values, 1, 0 and n (for nonsignificance). That is, I assigns each initial wff A exactly one of the three values, 1, 0, n. I is extended to all wffby the following rules – where for simplicity & is replaced as primitive by $\supset$ in terms of which & is defined thus: $A \,\&\, B =_{\mathrm{Df}} \sim(A \supset \sim B)$:

$$I(A \supset B, T) = \begin{cases} I(B,T) & \text{if } I(A,T) = 1, \text{ and} \\ 1 & \text{if } I(A,T) \neq 1; \end{cases}$$

$$I(\sim A, T) = \begin{cases} 0 & \text{iff } I(A,T) = 1, \text{ and} \\ 1 & \text{otherwise, i.e. if } I(A,T) \neq 1. \end{cases}$$

Truth and validity may be defined as before. Then, as shown in Slog, A is a theorem of S iff A is valid under this three-valued significance interpretation. Again the logic is hardly satisfactory as a significance logic (as Slog explains), since there is but little scope to express the nonsignificance of non-initial wff, especially negated wff, as the logic so interpreted contains no classical negation.

The issues of nonsignificance are not so closely bound up with the main issues of noneism, non-existence and intensionality that we cannot get away, for the most part and at least early on, with one or other of the strategies outlined for disposing of significance problems and keeping the sentential calculus classical in form. (Alternatively, we can simply follow the procedure of Slog, 5.3, and restrict the initial wffto significant values.)

The issue of incompleteness is not quite so readily escaped since incompleteness is tied up with existence (in ways Slog tries, not entirely successfully, to make explicit): yet we want, at least in initial logical investigations, to avoid the complexities an explicit treatment of incompleteness can generate. Again there are several options open, irrespective, by and large, of which assertions get counted as incomplete. Firstly, as with nonsignificance, we can simply exclude incomplete sentences as initial wff; for the compounding principles, with & and $\sim$, never appear to lead from completeness to incompleteness. Secondly, we can adopt a falsidal approach and map all elementary incomplete assertions to falsehood: but that this sort of approach, on its own, leaves much to be

desired is evident from such incomplete assertions as the Truth-teller statement, namely "This very statement is true", which we seem to have no reason (outside a questionable doubling back to the Liar statement) to count as false rather than true. There remain other more formally interesting approaches, not available in the nonsignificance case, which rely on important differences between the logics of nonsignificance and those of incompleteness. When p_0 is nonsignificant, so, under classical construal of connectives, is $p_0 \vee \sim p_0$. But even when p_1 is incomplete such assertions as "if p_1 then p_1" and $p_1 \vee \sim p_1$ are not, it seems, incomplete. This observation offers the way in particular to two further approaches to incompleteness, the supervaluational method and the procedure of treating incompleteness as a cross-classification on truth-valued assertions.

The supervaluation method is a two stage affair: firstly (admissible) valuations are characterised, and then supervaluations are defined over these (i.e. in terms of admissible valuations). The initial objective[1] of the method was to obtain a (semantical) way of allowing for violations of bivalence, for assertions which are neither true nor false, and also perhaps for assertions which are both true and false, without upsetting the formalism of classical logical theory, or one of its central semantical notions, that of validity. Where incompleteness occurs, though some assertions will be assigned value true and some value false, some – incomplete assertions – will be assigned neither of these values (but no value, or some other value).[2] The basic idea is that an admissible valuation arbitrarily assigns these incomplete assertions one or other of the values true or false, and that all such admissible valuations are taken – so that any incomplete assertion is assigned true on some valuations and false on other valuations, with the net effect expressed in the superimposed valuation, the supervaluation or resultant, of cancelling the specific arbitrary assignments.

To reproduce classical logic in terms of the supervaluation method, the admissible valuations are classical, i.e. two-valued valuations which assign each wffexactly one of the values 1 and 0, and which conform to the classical rules for &, $\vee$, $\sim$. To illustrate the procedure let q_1 represent some true assertion (e.g. "Pegasus is a horse") – and q_2 some incomplete assertion (e.g. "Pegasus is 14 hands high", "Kingfrance is bald" or, to take a different sort of case, " 'Homological' is homological"). In the two assertion situation

[1] It soon turned out that there was much else such methods were good for, including replacing classical logical theory.

[2] Similarly where overcompleteness occurs, some assertions will be assigned both values.

$\{q_1, q_2\}$ there are just two classical valuations I_1 and I_2: the way they assign values and how a supervaluation is determined in terms of these the following table shows (cf. van Fraassen 1966, p. 487):

Assertion	*valuation* I_1	*valuation* I_2	*van Fraassen supervaluation*	*Routley overriding valuation*
q_1	1	1	1	1
q_2	1	0	–	i
$\sim q_1$	0	0	0	0
$\sim q_2$	0	1	–	i
$q_2 \vee \sim q_2$	1	1	1	1

Key: Dashes indicate truth-value gaps; i indicates incompleteness construed as an overriding value. Supervaluations, or overriding valuations, are determined from valuations in the way indicated.

The example illustrates the method. Now to be precise, and more general: With respect to a given logic or language L and a given class of admissible valuations for L (i.e. functions from sentences into truth or holding values 1 and 0) a valuation s is a *supervaluation* iff for every wff A of L,

$s(A) = 1$ iff $I(A) = 1$ for every admissible valuation I, and
$s(A) = 0$ iff $I(A) = 0$ for every admissible valuation I.

On van Fraassen's account (van Fraassen 1971, p. 95) $s(A)$ is not defined otherwise; on my account $s(A) = i$ otherwise.[1] But for validity these differences make no difference. Validity for L is defined in terms of supervaluations in the expected way, namely A is *supervalid* (with respect to L) i ff$s(A) = 1$ for every supervaluation s (with respect to L).

Where the admissible valuations are classical, *a w ffA is a theorem of* S *iff A is supervalid*. That is, the supervaluation method, though it allows for incompleteness, leaves the class of theorems of S unchanged. The argument (which extends to the much more powerful logics subsequently introduced) is straightforward. Suppose A is ordinarily

[1] The method is usually attributed to van Fraassen 1966 who applied it to deal with truth value gaps. The method was however found independently by the author (in fact in 1964) and used to deal with truth-value gaps and statement-incapability generated by paradoxes: see especially NE, pp. 297–98. The apposite supervaluational terminology is of course van Fraassen's: use is made of his much more elegant presentation.

valid, i.e. $I(a) = 1$ for every classical valuation. Then $s(A) = 1$ for every supervaluation; so A is supervalid. Suppose conversely A is supervalid, i.e. $s(A) = 1$ always. Then $I(A) = 1$ for every classical valuation, so A is valid. (The table given reveals that supervaluations are but a way of reorganising data about validity.)

The supervaluational method of van Fraassen 1966 supposed, what the theory of objects rejects, that most ordinary properties cannot be assigned truly or falsely to items that do not exist; that is, van Fraassen took for granted, what is unacceptable, a weak version of the Ontological Assumption. That presupposition is in no way, however, an essential feature of use of supervaluations. What is essential to the method is that falsity of assignment excludes incompleteness: but does it? Look at a – it does not matter whether it exists – ask whether it has f? If it does, af is true. If, for any of a variety of reasons – including incompleteness – it does not, af is false. Incompleteness emerges in *other* ways (e.g. in $a{\sim}f$ also being false). This suggests that incompleteness is a cross-classification, not something like a further truth-value as it is on the supervaluation picture. For example, that the king of France is bald is both false and incomplete: but there is no gap. To pursue such an approach is to reject the supervaluation method.

The supervaluational method, although it has the substantial advantage of leaving the *logic* S intact (it does interfere with such semantical notions as logical consequence), has other serious drawbacks. A first is a very serious restriction on what can be said: in particular, one cannot state in the logic that a statement is truth-valueless, or reason therein about its truth-valuelessness,[1] yet often it is important to be able to do just that.

For example, we shall want to consider the systemic thesis: if an object is incomplete in some respect then it does not exist; and we should want to be able to investigate *within* the logic what the truth-valuelessness of the Liar statement would entail. Secondly, many of the complex problems in admitting truth-value gaps reappear with the supervaluational method (see the discussion of thesis (II), p. 19 ff.).

A supervaluational approach is not, then, the way we want to take; for the approach sometimes gives the wrong results, prevents what needs to be said from being said directly, and unduly complicates the logic of intensionality and inexistence. This is not to say that supervaluational methods are not formally viable, or valuable for various purposes. They are. The same applies also to other members of the larger class of valuational

[1] This was the reason given in NE, p. 299, for not persisting with the method, i.e. with Interpretation 1.

methods to which supervaluations (or two level valuations) belong, the class of hierarchical valuational methods, where higher valuations are defined through valuations further down the pyramidal hierarchy.[1]

The cross-classification treatment of incompleteness has already been seen at work. It can occur, for instance, in an attenuated way with Russell's theory of descriptions where the falsity of both "The present king of France is bald" and "The present king of France is not bald" reveals the incompleteness of the present king of France as regards baldness. The king is not similarly incomplete as regards existence. Some false statements are, then, on the cross-classification view, incomplete. Such incompleteness could, and perhaps should, be represented in the logic by an incompleteness connective I read "It is incomplete that". Connective I is intensional; for the statements "The present king of France is bald" and "The present king of France exists" are truth-functionally equivalent, since both false, but one statement is incomplete or indicates incompleteness, and the other does not. Thus, as only extensional connectives can be defined in S, I cannot be defined in S. To treat incompleteness sententially, whether as a primitive or as a defined notion, S will have to be enlarged. And really an enlargement of S which takes account of subject-predicate structure is required. For what one wants to say (what we started by saying) is not so much that p is incomplete but that, where p is of the form af, a is incomplete in respect of feature f. It is objects, in the first place, that are incomplete with respect to certain features, though this may be reflected back into incompleteness of statements. Also the notions in terms of which incompleteness (of the requisite sort, namely *indeterminacy*) may be introduced, e.g. predicate negation, are rather more naturally considered (in the first place at least) when further syntactical analysis is made which exposes predicates.[2]

[1] For example, the semi-valuational methods used very successfully by Latin American logicians belong to this class. Semantics for intensional logics such as P and S4 which use valuations defined in terms of semi-valuations, fall within a general characterisation of supervaluational methods – if both admissible valuations and supervaluations are allowed to be *partial* functions (as supervaluations are on van Fraassen's account) – upon identifying semi-valuations with admissible valuations and valuations with supervaluations. For a fuller discussion of these important methods, and how they can displace world semantics, see Routley and Loparić 1978 and references cited therein.

[2] But once the analysis is made and indeterminacy characterised, the notion can be extended and reflected back into statemental logic, and the logic of I examined at that level. The extension is from the equation, $Ixf = {\sim}xf \;\&\; {\sim}x{\sim}f$, to the sentential form, $IA = {\sim}A \;\&\; {\sim}\bar{A}$, where predicate negation is widened to a kind of sentential negation. It is to be expected that the sentential logic of I, like that of contingency, ∇, which it resembles, will be somewhat messy (except perhaps in stronger systems, where the logic of ∇, for example, becomes very elegant). The comparison of indeterminacy with contingency may be brought out by connecting external (sentence) and internal (predicate) negations in terms of a single negation $-$ and a scoping predicate T. Then ${\sim}A = -TA$ and $\bar{A} = T{-}A$; so $IA = -TA \;\&\; -T{-}A$,

In any case, a logic for a theory of objects depends upon an analysis of sentences into syntactical parts (in terms of which indeterminacy can then be introduced); otherwise there is no way of representing talk about objects in the logic. In a *zero-order logic* sentential components are analysed into subject-predicate forms, with multiple subject forms expressing relations. To enlarge S to a zero-order logic SQ the vocabulary of S first requires expansion, for instance thus:

$$\text{initial terms, or subjects} \begin{cases} \text{subject variables:} & x, y, z, x', \ldots \\ \text{subject constants:} & \begin{cases} a, b, c, a', \ldots \\ x_0, y_0, z_0, x_1, \ldots \end{cases} \end{cases}$$

$$\text{initial predicates} \begin{cases} \text{predicate parameters of } n \text{ places} \\ \text{(with } n \text{ a positive integer):} & f^n, g^n, h^n, f^{n'}, g^{n'}, \ldots \\ \text{predicate constants of } n \text{ places:} & f^n_0, g^n_0, h^n_0, f^n_1, \ldots \end{cases}$$

The additional formation rule, that goes along with the expanded vocabulary for composing terms and predicates into wffor sentences is as follows:

> Where $x_1, \ldots, x_n$ are n subjects or terms and f^n is an n-place predicate, then $(x_1, \ldots, x_n)f^n$ is a (elementary) wff.

Where convenient the vector $(x_1, \ldots, x_n)$ will be written in vector notation as $\underset{\sim}{x}$; thus $(x_1, \ldots, x_n)f^n$ abbreviates to $\underset{\sim}{x}f$ (the conventions are as in Slog, chapters 3 and 7).

The postulates of SQ are exactly those of S, but formulated in the expanded vocabulary. The semantics for SQ also can be treated as a trivial variation of those given for S. In a *truth-valued* semantics, the interpretation I simply assigns each elementary wff $\underset{\sim}{x}f$ one of the holding values 1 or 0 at T (i.e. $\underset{\sim}{x}f$ is treated like p, its syntactical analysis ignored). Then soundness and completeness arguments proceed as for S, with the result that a wff A is a theorem of SQ iff A is SQ-valid under the truth-valued semantics. But it is much more instructive to give an *objectual* semantics for SQ, not just to prepare the way for quantificational logic, but to separate important philosophical issues. The main logical problem with any theory of objects has very commonly been taken as essentially

paralleling the equation $\nabla A = {\sim}\Box A \;\&\; {\sim}\Box{\sim}A$. But it is only a parallel, and the logic of contingency does not furnish a logic of indeterminacy, since, e.g., $\Box$ differs logically from T. In particular, $IA \rightarrow {\sim}A$ is true but $\nabla A \rightarrow {\sim}A$ is false.

linked with the use of quantifiers; but in fact the key issues separating referential and nonreferential positions arise at the zero-order stage where no quantifiers occur, though domains or sets of *objects* do.

An *objectual model* $\underset{\sim}{M}$ for SQ is a relational structure $\underset{\sim}{M} = \langle T, D, I\rangle$ where T is as before, D is a (nonnull) domain of objects, and I is an interpretational function which, in addition to assigning holding values, as before at T to initial wff, assigns to each subject an element of D and to each initial n-place predicate at T an n-place relation on D^n (i.e. the n-place Cartesian product $D \times D \times \cdots \times D$ of D), for each n. The new, and critical, interpretation clause is that for elementary wff:

$I((x_1, \ldots, x_n)f, T) = 1$ iff $\langle I(x_1), \ldots, I(x_n)\rangle \quad \iota$
$I(f^n, T)$, i.e. $(x_1, \ldots, x_n)f$ holds at T iffthe ordered n-tuple of objects $I(x_1), \ldots, I(x_n)$ instantiates the relation of objects $I(f^n, T)$.

For example, let domain D contain, or consist of, Newton da Costa and Sherlock Holmes, and take f as "admires" and consider "da Costa admires Holmes", symbolised say, $(a, b)f$, with f interpreted as the relation of admiration on D. Then that da Costa admires Holmes is true in the model, i.e. $I((a, b)f, T) = 1$, iffwhat a is about (i.e. $I(a)$), namely da Costa, and what b is about, namely Holmes, together instantiate the relation of admiration of T, i.e. da Costa and Holmes stand in the relation of the first admiring the second. Otherwise, apart from the critical clause, truth and validity are defined as for S. Proof of the adequacy of the objectual semantics for SQ can, with only a little terminological adjustment, follow well-trodden routes.

There is nothing technically problematic about the objectual semantics at all. True, it involves objects and domains of these, and only some of the objects and none of the domains exist on the intended understanding of the semantics, but that has little bearing on the clarity of the semantics, which involve naught but clear and distinct notions, *domain*, *object*, *holding*, etc. A domain of objects is simply a set of objects (in the sense of *abstract set* subsequently articulated, and axiomatised by relevant naive set theory), and objects are, as before, the most general items of signification. "Object" is used in essentially its ordinary general sense (that given e.g. by the OED) to mean "item possibly thought of, reflected upon, conceived, apprehended, presented to some sense, ...", or, what is intended to be equivalent, "item of which something is true". One half of the equivalence follows from the fact that each element of the listing (provided the "...",

allowing for further disjuncts, is correctly interpreted) ascribes a feature; the other half from the fact that anything true of an item, if not already implied (as it would be, since anything can be thought of), could be added to the list. Important contrasts are with the much more restricted terms, "entity" and "being", both of which mean "thing (object) that exists" (cf. again OED). Thus, for example, such notions as "impossible entity" and "merely possible being" involve contradictions, but "impossible object" and "merely possible item" do not. Everything is an object, not everything a being; for example (so it will be argued) numbers are objects, not beings, and the same holds for all purely abstract objects. Similarly fictional objects, dream objects and most mental objects, are not beings. Just as objects are not confined to beings or possible beings, so they are not constrained by experience or possible experience (in the main sense of the ambiguous phrase "possible experience"); it is not required of an object that it conform to Kant's restrictive "universal conditions of possible empirical knowledge". (For more on objects, see chapter 4 [i.e. Vol. 2 *—Eds.*], §1.)

The semantics is quite undemanding as to what objects are: it is enough that objects can have properties and stand in relations, and this (by the Independence Principle) nonentities can do. The example of admiration already reveals as much, and that is only one example from that vast storehouse of such examples, recorded natural discourse. The semantics thus helps confirm theses already advanced, that logic need impose *no* requirements on its objects as to existence, consistency, completeness, determinacy, exactness, sharp-identity-criteria, enumerability, or the like. Despite assertions to the contrary of the great and powerful, none of these requirements are necessary. Logically, as conceptually, objects can be anything, any object of thought or discourse, just as thesis (M1) has it.

Several of the distinctive features of the logic of items can already be included in SQ, without introducing quantifiers. For example, the versions of the theory of predicate negation and indeterminacy (explained below) can be added directly to SQ. Likewise an existence predicate "E" can be included in SQ, and the Ontological Assumption simply countermodelled. For consider the factual model with domain $D = \{\text{Holmes, da Costa}\}$, where the *factual* model is one in which I assigns in accordance with the factual data. Then $I(aE, T) = 1 \neq I(bE, T)$. Let g be the one-place predicate $(a, \ldots)f$ (in effect "... is admired by da Costa"). Then $I(bg, T) = 1$ but $I(bE, T) \neq 1$. In short, a basic natural logic, in which some particular and some general assertions about existence can be made,

may be elaborated in advance of any use of quantifiers. Quantifiers are not of the essence when it comes to determining existential claims or commitment.[1]

Zero-order logic SQ – which is classical in form but subject to several interpretational qualifications – provides then a minimal logic of objects. But it is a rather thin and threadbare system: it contains no descriptors or quantifiers, and so it fails to separate free from neutral logics; it contains no (satisfactory) implication or conditional; it includes no modalities; and it allows only some of the important theses concerning objects to be satisfactorily stated. It will have to be enlarged upon. The first enlargement can again take what is syntactically a classical direction, the addition of quantifiers, and the move to a first-order language.

Beyond the zero-order there are the first-order quantificational logics, and, as far as ascending the familiar order hierarchy is concerned, that is all. Here at least there is (superficial) agreement with Quine. Objectually, higher orders make at best dubious sense, and are unnecessary; for, to begin to diverge from Quine, what they try to say, and more, can be expressed much more satisfactorily in alternative ways. But first, first-order logics.

§16. Neutral quantification logic.

Reasons for introducing quantifiers and proceeding beyond statemental logic to first-order logic are presented in almost every logic textbook: what is not so often stated is that there are similar grounds for proceeding far past where most logic textbooks stop, first-order theories. The main reasons are of course that much philosophically important discourse and many arguments cannot be adequately formulated or assessed without exposing more logico-syntactical structure than zero-order forms permit. For example, without quantificational analysis there is no way of revealing as valid such sound arguments as syllogistic forms – e.g.

Every dragon is a monster;

[1] This refutes the following thesis, to which, according to Hintikka, Quine's thesis, that to exist is to be the value of a bound variable, reduces, namely

OT. The only way of committing oneself ontologically is to use existential generalisation,

a thesis Hintikka advances (Hintikka 1959, p. 135) but leaves undecided (p. 136). For a creature that did not speak quantificationally could still commit itself ontologically, e.g. in an SQ-ish language. Quine's thesis, which is incompatible with the theory of objects, is critically examined in chapter 3 [i.e. Vol. 2 *—Eds.*].

Some dragons breathe fire;

Therefore,

Some monsters breathe fire –

or particularisation, e.g.

Socrates no longer exists;

Therefore,

Some thing no longer exists.

Exposing the quantifier terms "every" (represented, approximately, U) and "some" (P) is only one part of the orthodox story as to how validity of quantificational arguments is to be explained. Converting the given statements to a uniform underlying subject matter of things or objects (a conversion indicated, e.g., by the conclusion of the second argument), is the important second part of the story, and is a basic strategy in the reduction of apparently special syllogistic arguments to statemental arguments. The conversion uses the appealing strong identities, every ξ = every object which is an ξ, and some ξ = some object which is an ξ (even such equations have their replacement limitations however: e.g. one side is apparently about ξs, the other about every thing; one side concerns a collective, the other side distributes onto elements of the collective). Thus the first premiss of the first argument becomes: Every object which is a dragon is a monster, or, at one remove: for every object such that it is a dragon it is a monster. The introduction of (bound) object variables, in place of pronouns such as "it", "the first", etc., is the next part of the story, a part that becomes especially important in representing multiply quantified relational statements (e.g. "A sailor has a girl in every port", and the $\epsilon\delta$ statements of analysis defining convergence and uniform convergence). Using variables the sample statement becomes: For every x, such that x is a dragon, x is a monster. The final, and most questionable, part of the orthodox story is the elimination of "such that" or "which" clauses using extensional connectives of S. An initial ground for concern is that universal and particular assertions get different renditions, the universal sample becoming: For every x, if x is a dragon, then (materially) x is a monster, i.e. using obvious symbolisation $(Ux)(xd \supset xm)$, while the particular: For some x, such that x is a dragon, x breaths fire, becomes: For some x, x is a dragon and x breathes fire, i.e. in assumption-making symbols $(Px)(xd \,\&\, xf)$. But the results of the orthodox story

are most impressive – at least in the examples chosen and a great many others. The syllogistic argument, for instance, becomes

$$(Ux)(xd \supset xm),\ (Px)(xd\ \&\ xf);\ \text{therefore}\ (Px)(xm\ \&\ xf),$$

which now *follows* by elementary quantificational steps (primarily quantifier distribution) from the sentential principle of factorisation: $A \supset B \supset .\ A\ \&\ C \supset B\ \&\ C$. Note that the assessment of the argument has *nothing to do with existence*: dragons do not exist, nor do living fire-breathing monsters, but that makes no difference to the determination of validity.

The glamour of the quantification analysis of syllogistic reasoning palls somewhat when it is seen that the (rightly) celebrated method renders logically invalid such seemingly correct arguments as:

Every man is mortal;

Therefore,

Some man is mortal.

The trouble is not that *every* does not imply *some*, that (every $x \ni xm_1)\ x\ m_2$ does not imply (some $x \ni xm_1)\ x\ m_2$, but that $xm_1 \supset xm_2$ does not imply $xm_1\ \&\ xm_2$. The trouble, that is, lies with the usual extensional theory of restricted variables associated with classical logic. The fault is not then a fault of quantificational logic as such, but of an auxiliary theory designed to extend its scope so that it can, among other things, formalise syllogistic reasoning and subsume traditional logic. What is required – an exercise that can be conveniently postponed since the viability of quantificational logic is not affected by the matter – is an improved theory of restricted variables.[1]

In summary, the steps in transforming English syllogistic components to quantificational logical form are, in the universal case, these:

[1] The criticism of relevant logical theory that it has so far no satisfactory theory of restricted variables – which is true – can hardly be made from a classical standpoint as if it were a point against relevant logics: if it should be, the reply is simply *tu quoque*.

Quantifier exposure	*Uniformization*	*Connective exposure*	*Variabilization*	*Extensionalization*
(Every ξ)f	(Every object which is an ξ)f	Of every object, which is an ξ, it f, *or* For every object such that it h, it f, where "h" abbreviates "is an ξ".	For every x, such that xh, xf	$(Ux)(xh \supset xf)$

The steps in the particular case are analogous. One major feature to which direct attention has not so far been drawn is the assumption that class-term quantifiers, such as "every" coupled with class-term ξ, can be reduced to an operation on the elements of the class (and other objects); that is, that there are no collective quantifiers which depend on the structure of the class. Without doubt natural languages include collective quantifiers which do not reduce in such a straightforward way – or even at all – to *distributive* quantifiers, which do distribute onto elements (cf. Vendler 1962). Though a place is made for collective quantifiers in the general logical theory subsequently developed, the prime concern in what follows is with distributive quantifiers; for the main quantificational issues confronting theories of objects all involve distributive quantifiers.

The distributive (unary) quantifiers that can be grafted easily onto zero-order logics are the sentence forming operators U (read now, exactly, "for every")[1] and P ("for some") which, concatenated with single variables, take wffinto wff, typically binding variables in the course of the operation. The formation rules of neutral quantification logic make this precise:

1. Every wffof zero-order logic SQ is a wffof Q, i.e. the formation rules of S together with the additional subject-predicate rule of SQ are also formation rules of Q.
2. Where A is a wffof Q and x is subject variable, $(Ux)A$ is a wffof Q.

Often U is elided, i.e. $(x)A =_{\text{Df}} (Ux)A$. The particular quantifier P is defined: $(Px)A =_{\text{Df}} {\sim}(Ux){\sim}A$. Quantifier P is read "for some", *never* "there exist". P is not an existential quantifier. Because locutions of the form "for some x $A(x)$" are sometimes clumsy in Eng-

[1] Alternatively U may be read "every" and the "for" read into the bracketing. However, bracket-free notation brings out the unsatisfactoriness of doing things this way.

lish $(Px)A(x)$ will also be read, occasionally, "There is an x such that $A(x)$" or "There are As". In this work, unless existential loading is explicitly indicated, "There are As" *never* means more than "Some object is an A", i.e. $(Px)A(x)$: it does *not* imply As are or As have being or As exist. "R believes there are winged horses" says no more than "R believes some items are winged horses", which derives from, e.g., "R believes Pegasus is a winged horse": it does not say "R believes winged horses exist", or "R believes in winged horses" where this entails "R believes there exist winged horses". It is true of course that in everyday nontechnical discourse "There are [is]" commonly, though by no means invariably, carries existential loading, and so amounts, in context, to "There exist[s]". For this reason use of "There are [is]" as a technical term not implying existence of any sort involves a calculated risk, the risk of being misconstrued (whether deliberately or otherwise). But it has the advantage which introduction of new phrase or cooption of a lesser or differently used expression, would not give, that of being able to take over almost the whole of classical mathematics as already existence-free in its formulation. In respect of ways of clearly particularising without attributing existence, English appears to be at a slight disadvantage compared to some other languages, e.g. Later Latin and German, where Descartes' "datur" and Meinong's "es gibt" can be used without contextually implying existence (but it may well be claimed that these philosophical uses are already semi-technical). English does however contain verbs which it may be worth coopting to substitute for "is" in the existentially-loaded sense, e.g. "particularize" (but "There particularize nonexistent objects" is going to be difficult to get used to). But even if such terminology were accepted, its advantages would be limited while the copola "is" remains unchanged; the transitive verb "is" cannot easily be given away without also sacrificing straightforward and natural ways of stating noneist claims, such as "Pegasus is a horse" and "Meinong rightly believed the round square is round". There is however no need to abandon the transitive "is" (the intransitive "is" *can* be separated: see chapter 3 [i.e. Vol. 2 *—Eds.*]). For the Ontological Assumption is not incorporated in English – only in many speakers', especially philosophers', use of it.

Although the reverse notation is adopted in formulation of the language in the extrasystemic vocabulary, where A, B, C, etc., express wff, such notation as $A(x)$, $B(x, y)$, etc., will be used to exhibit wffwhich contain the displayed variables free. Free and bound variables are defined in a standard way; substitution notation and abbreviations are also

standard (see, e.g. Slog): in particular, $A(t/x)$ is A unless x is free for t in A and then is the result of substituting t for free occurrences of x in A.

The class of terms is also expanded, in a way that could have been adopted in SQ. To the primitive symbols function parameters and constants are added

n place function parameters: d^n, e^n, $d^{n'}$, ...

Constants result by subscripting. The formation rules for wf terms or subjects are as follows:

1. Initial terms, i.e. subject variables or constants, are terms;
2. Where $t_1, \ldots, t_n$ are terms and d is an n-place function parameter, $(t_1, \ldots, t_n)d$ is a term.

The quantificational axiom schemes of Q look like a rewrite of standard axioms (e.g. those given in Church 1956); syntactically they *are* a rewrite, but they mean something very different, i.e., the main differences from pure (i.e. unapplied) classical logic are semantical. To the schemes of SQ the following schemes are added:

Q1. $(Ux)A \supset A(t/x)$ (Instantiation).

The standard notation $A(t/x)$ requires that for nonvacuous instantiation x is free for term t in A.

Q2. $(Ux)(A \supset B) \supset .\ A \supset (Ux)B$,
provided x is not free in A. (U-Distribution).

RQ. $A \supset (Ux)A$ (Generalisation).

Subject to interpretational restrictions enlarging upon those already imposed on the interpretation and application of classical sentential logic, there is nothing amiss with pure classical quantification logic – apart, as we have seen, from the standard interpretations of the quantifiers. The new interpretational trouble is – to go quickly back over ground already covered – especially evident with the existential quantifier, $\exists$ – too commonly conflated with the particular quantifier, P – which is supposed to satisfy the

principle of existential generalisation:

EG. $A(t/x) \supset (\exists x)A$.

But let f be the predicate "is round and square" and t be the term "Meinong's round square". Then on Meinong's assignments, already defended, $tf \supset (\exists x)xf$ is false; for tf is true, but $(\exists x)xf$ is false, since there exists nothing round and square. EG in fact fails on quite ordinary assignments: for let a name something that does not exist (e.g. a is Pegasus), and consider the antecedent $a\bar{E}$, i.e. a does not exist. The statement is true; but what EG claims follows from it, $(\exists x)x\bar{E}$, that there exists an x which does not exist, is inconsistent.[1]

Furthermore, through EG, classical quantification theory commits us to, as allegedly logical truths, what are but contingent existential claims, e.g. $(\exists x)(A \vee {\sim}A)$. For that anything exists at all is a contingent matter, not a logical truth. On a *proper* modalisation of classical quantification logic, which separated the contingent from the necessary truths of the theory, it would be a contingent thesis that $(\exists x)(A \vee {\sim}A)$, i.e. in symbols $\nabla T(\exists x)(A \vee {\sim}A)$, *not* as readily follows on usual modalisations, $\Box(\exists x)(A \vee {\sim}A)$.[2]

The fault with EG, as free logics have helped bring out, is that a needed antecedent, tE, stating that t exists, has been omitted. With the corrected EG principle

CEG. $A(t/x)\ \&\ tE \supset (\exists x)A$,

the counterexamples and other difficulties adduced disappear. However, as shown, the free logic move does not go nearly deep enough. Quantification over possible objects is also required, and then, for essentially the same reasons, quantification over impossible objects. So results neutral quantification logic, the intended domain of which includes all objects.

An objectual model $\underset{\sim}{M}$ for Q is a structure $\underset{\sim}{M} = \langle T, D, I\rangle$ defined as before for SQ, except that, to cater for functional terms, I assigns to each n-place function at T

[1] This is one of the *bad* arguments for existence not being a predicate inverted so that a good argument results.

[2] $\Box(\exists x)(A \vee {\sim}A)$ is not valid according to free quantified modal logic, (or its neutral counterpart), but that is not a modalisation of classical quantification logic.

an n-place operation on D^n. I is extended to all wft and wffby the interpretation rules already given together with these rules:

> Where d is an n-place function term and $t_1, \ldots, t_n$ are n terms, $I((t_1, \ldots, t_n)d) = (I(t_1), \ldots, I(t_n))I(d, T)$; $I((Ux)A, T) = 1$ iff $I'(A, T) = 1$ for every x variant I' of I,

where I and I' are x-variants if they agree on all variables and parameters except perhaps at x. Holding, truth and validity are defined as for S. Then, again by familiar arguments, a wff A is a theorem of Q iff A is Q-valid. The arguments are almost exactly the familiar ones, because it is only in the choice of domain D and the surrounding interpretational hedgings that neutral logic Q differs from classical logic. But of course it is changing the role of D that makes all the difference; logical differences reflecting the change appear in the larger picture. Pure quantificational logic itself, despite the attention devoted to it, is really only a small part of the logical scene. What is important at this stage is that there are no interpretational restrictions on Q to objects that exist or that are suitably transparent; D may include incomplete as well as inconsistent objects. Nor does quantification logic require such restrictions; nor are they inevitable unless the semantical rules are construed in a way not intended, referentially. To put it differently, the neutral logic formulated has been formulated, extrasystematically, in neutral terms; e.g. "every" in the semantical rules does not mean "every existing" or "every entity which is such that"; the operations and relations spoken of in English phraseology are not taken to exist; and so on. To put the point in phraseology of the opposition, the metalanguage used and presupposed is Meinongian. That does not imply that the usual classical quantifiers cannot be expressed. They can of course in terms of usual restricted variables, e.g. $(\exists x)A \equiv (Px)(xE \ \& \ A)$. Much else too can be expressed by small additions to the logico-semantical theory. For example, by a modest enlargement of either the syntax or, better, the semantics, context can be taken into account (as Slog explains; see especially 7.2), and much of what is normally included in pragmatics thereby expressed in the theory.

Many of the more old-fashioned logical theories and axiomatisations of parts of mathematics and fragments of science can be reexpressed as first-order theories (cf. Mendelson 1964, p. 56). A *neutral first-order theory* is an axiomatic formal system enlarging Q by (*proper*) axioms or axiom schemes formulated in the notation of Q, which is closed under the rules of Q (i.e. Material Detachment and Generalisation apply not

just to theorems of Q but to theorems of the theory). Since (almost) every classical first-order theory can be restated neutrally, (almost) everything that can be expressed in a classical first-order theory can be neutrally stated, e.g. substantial fragments of classical mathematics can be neutrally expressed. The restatement is an important part of the neutral [re]statement of mathematics.

There is however one outstanding problem with the neutral reformulation of first-order theories that becomes serious once – what are hard to avoid – inconsistent theories, and objects, are encompassed; namely the matter of the limitations on rule γ of Material Detachment. For the rule is inadmissible in inconsistent cases (see, e.g., RLR). The limitations also suggest an appropriate restriction on the rule:

Provided T is consistent, from $\vdash_T A$ and $\vdash_T \sim A \vee B$ (one is entitled to) infer $\vdash_T B$,

where $\vdash_T C$ says that C is (provable) in or holds in T.[1] Most of the logical theories customarily examined in logic texts, with the exception of set and number theories, are certainly consistent, so the proviso can be detached, and the usual unqualified inference rule recovered. Where consistency is not certain, the classical formulations of theories can be said to proceed under the provisional assumption of consistency. If inconsistency is found, the assumption is contradicted, and the provision should be withdrawn, whereupon many inferential operations would stop. This gets at what seems right about Wittgenstein's (super-[2]) rule:

If a contradiction is encountered, Stop!

a rule which would indeed put an end to the insidious spread of contradictions given the classical scheme of things. But much is wrong with Wittgenstein's rule. Firstly, many of us, whether classically or paraconsistently inclined, or logically uncorrupted, do not stop reasoning in the face of contradictions or when a contradiction is encountered. Nor should we stop; for inconsistent situations are not alogical (see UL [reprinted in Vol. 4 *—Eds.*]). Secondly, the rule is not appropriately effective. It is as if the proviso on γ were to be replaced by the condition: Provided no theses of contradictory form have been proved. The proviso could always be got around by failing to complete any proof that looked as

[1] A rule of this form is defended in Routley 1980, and two difficulties dealt with, the sceptical objection that really no theories are known for certain to be consistent, all consistency proofs being relative, and the issue of the justification of the restricted rule.

[2] Unless the rule overrides other rules, proof and inferences may continue by other rules in contravention to the rule. In this respect the rule differs from the standard rules of inference of logistic systems.

if it were leading to a contradiction. Unscrupulous users, intent on yet more powerful theorems, would deliberately avoid encountering contradictions. Thirdly, then, what a logic contained as theorems would depend on who was using it and in *what order* they proved theorems. Wittgenstein's rule is thus formally unsatisfactory, in addition to failing as an adequate safety valve for a logic in case it should blow up.

A full neutral reformulation of a classical theory involves more then than reexpressing the quantifiers and other operators neutrally (and reshaping, what has not yet been fully considered, identity theory); it also includes exposing the provisional consistency assumption of theories whose consistency is unproven.

§17. Extensions of first-order theory to cater for the theory of objects: existence, possibility and identity, predicate negation, choice operators, modalisation and worlds semantics.

While existence and identity predicates can be represented in first-order theories, there is much of importance that cannot be so expressed, e.g. intensional connectives, predicate modifiers, collective quantifiers, and many descriptors. A comprehensive logical theory of objects that can get to grips logically with modern (and not merely peripheral) philosophical problems will have to allow for all these parts of discourse. Thus it is essential to proceed beyond the limits of first-order vision.

Even so, there is much that can be accomplished, if sometimes superficially, at the first-order stage. An obvious, and important, step is to introduce "exists" as a constant (logical) predicate. Such a move encounters an immediate obstacle, which acted for many years as a severe road-block to investigation of the logics of existence and nonexistence, namely the dogma of classical logical theory that existence is not a predicate.

Fortunately the dogma is now very much on the decline, and is no longer a serious impediment to logical investigations. Even so, criticising the dogma is far from flogging a dead horse. While the dogma will be rejected, a modified thesis will be defended in its stead.

1. *(a) Existence is a property: however (b) it is not an ordinary (characterising) property.* Since the dogma that existence is not a predicate, or not a property, is often supported by an (illegitimate) appeal to historical authority, it is worth remarking that some of

those who are cast as leading defenders of the dogma, in particular Kant to whom the thesis is traditionally attributed,[1] did not assert or defend the dogma at all, but asserted something rather closer to thesis 1.

Kant's thesis is (a) *"Exists" is a logical predicate but* (b) *it is not a real predicate, i.e. a determining predicate*, where

> a *determining* predicate is a predicate which is added to the concept of the subject and enlarges it. Consequently it must not be already contained in the concept ... [exists[2]] is not a concept of something which could be added to the concept of a thing. It is merely the positing of a thing, or of certain determinations, as existing in themselves, (Kant 1934, p. 282; 1929, p. 505).

The question: What sort of predicate is "exists"?, what sort of property existence?, is one that will recur: and then it will emerge that Kant's elaboration of his thesis (b) is seriously mistaken. The fundamental trouble with Kant's account of existence[3] lies in

[1] For example Kiteley introduces his paper Kiteley 1964 thus:

> Kant's laconic observation that existence is not a predicate has enjoyed an almost spotless reputation.

Even within the western analytic tradition the dogma has not had quite such a reputation. For example, it was not accepted by Moore, who characteristically said he was "not at all clear as to the meaning" of the slogan (Moore 1959, p. 115), and who elsewhere both introduced "exists" as a logical predicate (Moore 1959, p. 87) and explicitly took existence to be a property (Moore 1953, p. 300; but see also p. 372). With the advent of the broader free logic tradition (noted at the beginning of §14), the dogma has been regularly questioned and rejected. See also Nakhnikian and Salmon 1957.

[2] The translation Kant 1934 has "being" where I have for uniformity inserted "exists"; however Kant (appears to have) equated being and existence.

[3] There are other major defects as well, most notably in Kant's unnecessarily restricted notion of *object*. While it is true that existence is never analytically held, that "the object, as it actually exists, is not analytically contained in any concept, but is added to my concept ... synthetically" (p. 282) – which is enough to halt the Ontological Argument – the following elaboration Kant offers is in error:

1. "... through the concept[,] the object is thought only as conforming to the *universal conditions* of possible empirical experience in general, whereas through its existence it is thought as belonging to the content of experience as a whole" (p. 283). Both parts are seriously astray. There is no restriction on objects conceived that they be restricted either through possibility *or* through empirical requirements. And it is neither necessary nor sufficient for existence that an object be thought as belonging to the content of experience as a whole.
2. "... in dealing with objects of pure thought, we have no means whatsoever of knowing their existence, since it would have to be known in a completely *a priori* manner" (p. 283). Often we can know a priori that they do *not* exist – this blocks the sceptical moves Kant immediately proceeds to (p. 284) – and sometimes we can ascertain that something exists without a detour through perception, e.g. in terms of relations of an object to what exists, or through other marks of existence.

his assumption that what exists does not differ as regards content from what is possible: thus, e.g.,

> the content of both must be one and the same; nothing can have been added to the concept, which expresses merely what is possible, by my thinking its object (through the expression "it is") as given absolutely. Otherwise stated, the real contains no more than the merely possible (Kant 1934, p. 282);

and

> if we attempt to think of existence through the pure category alone, we cannot specify a single mark distinguishing it from mere possibility (p. 283).

As we shall see (especially in chapter 9 [i.e. Vol. 3 *—Eds.*]) there are important differences in content, and there are several marks, readily specified, which serve to distinguish what exists: an object exists only if it has a *right amalgam* of properties and the *right sorts* of properties.

The immediate object is however, to dispose of the unqualified claim that existence is not a property, and the claim that often goes with it (negating Kant's (a)) that existence is not a logical predicate. It will be argued that the Ontological Assumption is assumed in the main argument for the unqualified dogma, and that there is nothing behind the remaining arguments that cannot be better captured by the claim: existence is a property, but a somewhat special property. Furthermore the new claim, despite its lack of specificity, does make a difference: it permits an investigation of the logic of existence, and it removes another of the mechanisms shielding classical logical theory from legitimate criticism as to its limitations.

It might be thought that the dogma is not required by classical logic and that classical logicians have no reason to try and expose it. Superficially this is so: a rather uninteresting existence predicate can be defined in quantificational logic using the connection (a theorem of neutral logic) $xE \equiv (\exists y)(x = y)$, x exists iffthere exists something which is (the same as) x. Since $(\forall x)(x = x)$, $(\forall x)(\exists y)(x = y)$, whence $(\forall x)xE$, every thing^{E} exists. Thus too classically, any logical truth containing just one variable free

A pervasive defect of Kant's account is its subject-relativism, e.g. concepts are a determination of one's state, and underlying this, its human chauvinism.

can be used to define "E", e.g. $xE \equiv .\ x = x$. And then the property may be defined by abstraction, specifically by λ-conversion: Existence $=_{\text{Df}} \lambda x(xE)$ (whence, classically, Existence = Self identity!). The upshot, if this were all that could be said classically about existence, would be severe interpretational inadequacy: classical logic would have nothing to say about, and would be unable to assess arguments concerning, negative existentials, the existence of God, the existence of material objects and matter and space, of theoretical and fictional objects, etc.

The deficiency is avoided by admitting another – compatible but competing – predicate $E!$, well-defined for descriptions, but inapplicable to fully quantifiable subject terms. It is this predicate $E!$ which is the existence predicate; it is the predicate in terms of which it can be legitimately asserted, God does not exist, i.e. in classical canonicalised notation $\sim E!\ \imath x$ God x. It is this predicate, furthermore, that is not, or does not yield, a property and *cannot* do so. Classical theory need not deny (even if some of its exponents are inclined to deny) the obvious truth that "$E!$" or "exists" is grammatically a predicate.

The slogan "existence is not a predicate" was not intended (as Kneale 1937 and many others have pointed out) to deny that "exists" is a grammatical predicate of English (which it certainly is), but to deny that "exists" is a logical predicate. A *logical* predicate is, according to OED, "what is affirmed or denied of the subject": while *to predicate* is, logically, to "assert (thing) about subject" (OED again). Given such connections, it is a direct outcome of the Reference Theory that "exists" is not a logical predicate – or that "exists" does not signify a property (to put it in terms that not all those happy to talk about logical predicates would be prepared to use, because of the apparent commitment to universals). For suppose "exists" were a logical predicate: then in such negative existentials as "Blahblah does not exist" one would deny something (existence) of the subject, Blahblah. But this is impossible; for there is^{E} no such subject (i.e. object). Put differently, a true statement, a correct denial, would have been made about what does not exist, a property would have been assigned to a nonentity, contradicting the Ontological Assumption. Or, slightly differently again, it would follow (yes, by the OA) that Blahblah exists contradicting its nonexistence. With the proper abandonment of the Ontological Assumption goes the direct, and main, argument for "exists" not being a predicate.

Or differently again: If existence were a predicate, then all positive existential statements would be analytic and all negative ones inconsistent. But it is false that all existential statements are either analytic or inconsistent. So it is false that existence is a predicate.[1] The argument for the critical first premiss depends however on the Ontological Assumption: it is that the ascription of a predicate to a thing implies that the thing exists. Thus if $\sim aE$ then aE & $\sim aE$; while aE would, it is alleged, already imply aE.[2] Thus, again, the argument fails with the Ontological Assumption.

Some of the other arguments for the thesis are removed in the same sort of way, including a leading argument that logic cannot tolerate an existence property, without inconsistency. For suppose otherwise, the reductio argument begins, that $E!$ were a property. Then

(1) Nonexistence, i.e. in effect $\sim E!$, is a property. For, on standard Russellian assumptions whenever ψ is a property, $\sim\psi$ is also a property, as follows from property abstraction principles.

Now

(2) Nonentities do not exist. Therefore (by conversion)

(3) Nonentities have the property of nonexistence.

But

(4) Whatever has a property exists; $\psi(\imath x)\phi x \supset E!(\imath x)\phi x$, by PM, *14.21.

Hence nonentities exist, contradicting (2). The argument, though valid, is not conclusive, because it depends (essentially) on the Ontological Assumption in the shape of premiss (4).

Most other arguments for the thesis are also referentially based – inevitably, and unsurprisingly, since without assumptions of the Reference Theory the thesis is readily avoided. Consider, first, another leading argument designed to show that (classical) logic cannot admit a genuine existence predicate, i.e. one in terms of which one can truly say

[1] Cf. Wisdom 1931, pp. 62–3; Ayer 1946; and Broad 1953.

[2] A little more plausibly the ascription of existence is, wherever true, redundant, given OA. The redundancy alleged in statements like "There are horses which exist" is a contingent redundancy deriving from the fact that in the assumed context of occurrence "There are" carries existential loading, i.e. amounts to "There are^{E}". In other contexts, there is no redundancy, e.g. prefix the statement by "In contrast to Pegasus".

that $\sim aE$ for some term "a". The argument is yet another variant of the "problem" of negative existentials. If existence were a genuine predicate, then from truths of the form $\sim aE$ it could be inferred, by Existential Generalisation, what is impossible $(\exists x)\sim xE$. So . . . . The argument would work *were* EG correct; and its assumed correctness is yet another product of referential assumptions.

Consider, next, the contrastive argument, an argument based on the referential thesis: Everything exists (because quantifiers have to be referentially restricted and a thing just is an object of reference). The further assumption the argument uses, the contrastive assumption, is that every *genuine* predicate makes a contrast. But to add "existent" or "which exists" to a subject a is to add nothing. This argument tends to get itself into trouble, because proponents go on to say that to assert "a exists" is to assert nothing, because "exists" is redundant; and then find themselves saying that conversely to say that "a does not exist" is contradictory – which is obviously wrong given the previous claim. The usual escape from the latter predicament is well known: firstly, "a exists" is not redundant in the way a tautology is; and, secondly, "a exists" is misleading as to logical form and is not really of subject-predicate form, but, if anything (when a is a proper name it is nothing), a disguised quantified statement. The trouble with this escape has already been explained (cf. p. 41 ff.): "Exists" is only redundant where existential loading is presupposed, and then its redundancy is a contingent matter; where loading is not supposed as in "Pegasus exists" the predicate is not redundant. The logical form of "a exists" is the subject-predicate form, aE, which is perfectly in order as it is. The other assumptions of the argument fare no better. The contrastive assumption is decidedly dubious, and indeed appears to be refuted by mathematics where theorems often show that (analytic) properties are without contrast. And the first, referential, assumption has already been rejected. Since some things do not exist – nor is this an isolated phenomena, *most* things do not exist – "which exist" does make a contrast.

Remaining arguments that existence is not a predicate show at best that existence is not an (entirely) ordinary characteristic. Of this sort is Malcolm's point (Malcolm 1960, pp. 43–4) that *existence* would not be in a list of desired qualities to be sought in a chancellor. Nor would a great many other features (e.g. almost all logical and mathematical properties). All the point shows on its own is that existence is not the sort of predicate that would appear on such a list. If an attempt is made to generalise that point to the claim, which *might* be more telling, that existence is never a feature

that we would look for in anything, then the outcome is falsity. "There are many times where the important thing is to find out, not whether it has a long or short snout, but whether or not it is extinct or extant" (Kiteley 1964, p. 365). More important, there are certainly logical differences between what exists and what does not, e.g. such matters as indeterminacy, interrelation with entities (e.g. one cannot deposit 100 nonexistent, or imaginary, dollars in Goddard's bank account): that does not show that existence is not a predicate, without a redefinition of "predicate". There are significant logical differences between objects on either side in the classes distinguished by such category markers as "abstract", "individual", "physical", "mental", etc.; but that does not rule out categorical predicates as logical predicates.

Another argument of this sort runs thus:

> if existence is a predicate, then you should be able to affirm it universally and deny it particularly. You can, however, do neither of these. It is equally nonsensical to say either "All tame tigers exist" or "Some tame tigers do not exist". The square of opposition for existence-statements is fearfully truncated, indeed to the point of losing a dimension. Thus, existence cannot be a predicate. (Kiteley 1964, p. 367).

The argument is adapted from Moore's discussion (in Moore 1959); but Moore neither claims that "All tame tigers exist" and "Some tame tigers exist" are nonsensical – they are significant sentences – but only that they are "queer and puzzling expressions", nor jumps to the conclusion therefrom that existence is not a predicate. Moreover Kiteley proceeds to demolish the argument he has reconstructed from Moore's influential, but inconclusive discussion. Some fillings of the frames "All . . . s exist" and "Some . . . s do not exist" give natural enough expressions, e.g. "All the stamps in this issue exist". Even "All tame tigers exist" can be placed in a context that makes it come to life, as Kiteley shows with a nice example (p. 368). Such examples

> seem to show that the verb "exists" does have uses, perhaps predicative uses, that go easily and naturally through all the quantifier changes from *none to all* in the schedule of generality. Moore was not unaware of this. He found a use of "not exists", viz. being imaginary, that went through the schedule (p. 368).

In short, the assumption regarding the square of opposition is mistaken. But Kiteley fails to see his demolition job as demolition: indeed he repeats the extraordinary conclusion that

> If ... one use of "exists" can be found which does make nonsense out of universal affirmative statements in which it appears, then the concept of existence associated with this use of the verb would not be a predicate (p. 368).[1]

The same argument, *mutatis mutandis*, would show, if accepted, that all ordinary concepts are not predicates: consider, e.g. Moore's paradigm frame "All ... growl" and substitute "mental images" or "rhododendrons".

An argument similar to that adapted from Moore derives from remarks of Russell (already discussed in §12), namely

> If existence is a predicate, then there are certain kinds of inferences that should be valid. For example, the inference from "Donkeys exist and Eeyore is a donkey" to "Eeyore exists" should be valid. It is clearly not valid, so existence cannot be a predicate (Kiteley, p. 370).

Russell, recall, contended that the fallaciousness of these arguments with "exists" paralleled that of such "pseudo syllogisms" as "Men are numerous; Socrates is a man; therefore Socrates is numerous"; and that the arguments show that "exists", like "is numerous" is a predicate not of particular things, but of propositional functions. But (as previously observed) the arguments are not parallel. "Exists" is distributive, "is numerous" is not, the conclusion "Eeyore exists" is significant, while "Socrates is numerous" is not (parallels would replace "exists" by class predicates such as "are a species"). There are several things wrong with the argument Kiteley has constructed which however he does not observe. Firstly, being a (logical) predicate does not require validity of such inferences. Consider e.g. "is four footed" and replace "donkeys" by "foxes"; then the argument fails since "Foxes

[1] Kiteley claims that there is such a use, what he calls the "exiguous use". But he establishes neither that the use "makes nonsense out of universal affirmatives" nor that *this* shows that "exist" (in the relevant sense) is not a predicate. The characterisation of the "exiguous use" depends on the transformation from "... exists" to "There are^{E} (exist) ..."; but it is more plausible to say the transformation *breaks down* in the case of subjects of the form "all ... s" than that it defines a use. Consider, e.g., what happens to the truth "All existing tigers exist"; it maps into the doubtfully significant "There exist all existing tigers". But a minimum requirement on such a transformation is that it preserves truth. Kiteley has not defined a clear usage.

are four footed" is not a universal claim, but a normative one (rather "Foxes are normally four footed"; compare "Sassafras flowers in August"; etc.) Secondly, if "Donkeys exist" were construed universally as say "All donkeys exist" then the argument cited would be valid. But an expected reading of "Donkeys exist" is "Some donkeys exist", which leads to no expectation of validity, and does nothing to support the thesis. Nor is the predicate "exist" particularly unusual in suggesting a particular construal of a class term: Compare "Horses are black, horses are gray, . . . ", "Horses are sometimes seen here", "Horses get bots", "Hazels are found in England", "Pollution is a Japanese problem", etc.

The remarkable success of the arguments for existence not being a property – appallingly bad arguments, unless referential assumptions are taken for granted – encouraged philosophers to claim that a variety of other properties, among them some of the most important and interesting in philosophy, were not predicates, e.g. goodness, beauty, identity, diversity, numerousness, imaginariness. The arguments were however substantially weaker, since many of the arguments that applied in the case of existence, including all the more striking reductio arguments, did not transfer – except in the case of predicates of the same cast as "exists", such as "imaginary" and "fictional".

Consider – for the illustration is instructive for subsequent investigations (especially chapter 7 [i.e. Vol. 2 *—Eds.*]) – Ryle's case that "being imaginary is not an attribute" (conclusion (1), Ryle 1971, p. 81). Ryle's arguments parallel precisely, indeed are modelled upon, the standard arguments that existence is not a property, almost all of which turn on the Ontological Assumption and collapse when that is removed. For example, Ryle supposes that "an imaginary elephant has none of the attributes of an elephant or of any thing else" (p. 65) because what and only what exists has attributes, "a thing's being red or being an entity or being an object just consists in the fact that it has attributes" (p. 64), i.e. because of none but the Ontological Assumption (which gets repeated over and over again on pp. 64–5). Ryle's case is however marginally informative, for it helps to confirm the claim that what is correct in the "Not a property" doctrine, i.e. the small part that is not bound up with the Reference Theory, can, without loss, be more satisfactorily captured by saying "Not a property of a certain sort".

In sum, the standard arguments that existence is not a property do not establish the intended conclusion, but reveal rather that existence is not a characteristic, i.e. not a characterising property, and, at the same time, that existence is not an assumptible

feature. They also help in showing (what earlier arguments made plain) that subjects do not always carry existential loading, and that existence is never necessarily had.

2. *"Exists" as a logical predicate: first stage.* Existence is a non-trivial predicate, which makes a contrast; for something exists, but not everything does. Some things, such as Pegasus and square circles, do not exist. These elementary truths cannot be stated in pure quantificational logic, however, whether interpreted classically, or reinterpreted neutrally. If the quantifiers are read, as in classical theory, existentially, then while it can be "said" that some things exist, through such circumlocutions as $(\exists x)(p \vee {\sim}p)$, it cannot be said that some things do not exist, on pain of contradiction. If however the quantifiers are read nonexistentially, then while it can be consistently admitted that some things do not exist, classical ways of stating that some things exist are lost. An escape from this dilemma is easy however once an existence predicate is introduced, or defined – a procedure to which there is now (in view of the preceding subsection) no bar. At this, first, stage "exists" is introduced as a further primitive and some of its logical features investigated; subsequently, in later stages, the question of whether it can be defined and, if so, how, is addressed.

The system QE of quantified neutral logic with existence results from Q by the addition of one-place predicate constant E. (Alternatively, one of the constants of Q may be assigned the role of E.) The formation rule for E is just that for such constants, i.e. where t is a subject term tE (read "t exists") is a wff. There are, at least in the base system QE, no special postulates on E. Even so, much can be accomplished in QE, syntactically, proof theoretically, and semantically. Syntactical and also proof-theoretical applications, such as the recovery of free logics and of various other logics without existential presuppositions, are facilitated by defining existentially-loaded quantifiers in terms of E. Appropriate definitions, in the classical restricted variable pattern are these:

> $(\exists x)A =_{\mathrm{Df}} (Px)(xE \;\&\; A)$, i.e. there exists an x for which A ifffor some x which exists, A; $(\forall x)A =_{\mathrm{Df}} {\sim}(\exists x){\sim}A$.

It is readily provable, using quantification logic that

> $\vdash (\forall x)B \equiv (Ux)(xE \supset B)$,

i.e. every existing x is B ifffor every x such that (classically) x exists, B. Once the theory is modalised (as in a subsequent subsection), stronger equivalences than material connec-

tions may be established; in particular, main equivalences can always be strengthened to strict (i.e. logically necessary material) equivalences, as in $\vdash (\forall x)B \leftrightarrows (Ux)(xE \supset B)$. The quantifier may commonly be read "for every existing" or "for all actual".

With this little apparatus several sentences usually judged to lie beyond the scope of the formalism of quantification theory can be symbolised e.g. "Churchill exists" can be represented cE and "something exists" $(Px)xE$. Substitution in the theorem

$yf \supset (Px)yf$ gives $cE \supset (Px)xE$,

i.e. if Churchill exists then something exists. All the usual predicate inferences can be specialized in this way for the predicate "E"; e.g. from $(Ux)(xf_0 \supset xh_0)$, (say, all unicorns are one-horned) and $(Px)(xf_0 \,\&\, xE)$ (some unicorns exist) follows $(Px)(xh_0 \,\&\, xE)$, i.e. $(\exists x)xh_0$ (there exist one-horned things). A generalization of "Round squares do not exist", radically interpreted, can be symbolized $(Ux)(xf \,\&\, {\sim}xf \supset .\ {\sim}xE)$; and in view of the equivalence: $(Ux)(xf \,\&\, {\sim}xf \supset .\ {\sim}xE) \equiv {\sim}(\exists x)(xf \,\&\, {\sim}xf)$, can alternatively be expressed in the regular way as ${\sim}(\exists x)(xf \,\&\, {\sim}xf)$. "Some things do not exist" is symbolized $(Px){\sim}xE$; its equivalent "not every item exists" by ${\sim}(Ux)E(x)$. These sentences do not yield contradictions, a point about which there need be no difficulty so long as it is remembered that "a does not exist" can be explicated by "'a' is a subject term without a referent". Thus $(Ux)E(x)$ is not universally true – unless the class of domains with respect to which interpretations are allowed is severely, and illegitimately, curtailed – and is *not* a theorem, as can be demonstrated using a decision procedure for monadic predicate calculus under which E is treated as an ordinary predicate. But "There are things that don't exist", i.e. $(\exists x){\sim}E(x)$, is impossible since it is equivalent to $(Px)(xE \,\&\, {\sim}xE)$. Thus too

$\vdash (\forall x)xE$, i.e. everything^{E} exists, or, more trivially, every thing which exists exists.

This is the $\forall$-interpretation theorem, $\forall$IT. Correspondingly for existential quantifier $\exists$, $\vdash {\sim}(\exists x){\sim}xE$, i.e. it is not the case that there exists a thing that doesn't exist. $\vdash A(t/x) \,\&\, tE \supset (\exists x)A$, existential generalisation, is admissible provided the item guaranteeing generalisation exists. The principle is of course the free logic existential generalisation scheme FEG, already much discussed.

Recovery of free logic is now in sight. For it follows, since the distinctive theses of free logic (∀IT and FEG) have been derived that *free quantification logic is embedded in* QE. But a better result can be obtained, namely

QE *is a conservative extension of free quantification logic,* FQ;

that is, where A is a wffof FQ, A is a theorem of FQ if and only if A is a theorem of QE (counting in defined quantifiers). One half of the theorem follows from the previous theorem, but the converse half requires much more work (for requisite details of a semantical proof see DS, p. 616; for a more complex proof-theoretical argument see SE, p. 256, and a correction thereto). Thus QE includes, appropriately, free logic, but rightly proceeds beyond it.

Several other logical systems, aimed at rectifying in varying (usually insufficient) degrees the manifold faults of classical logic, can also be recovered or represented in QE. Examples (some of them considered in detail in SE) include Rescher's two-sorted logic of existence (of Rescher 1959); Hailperin's theory (in Hailperin 1953), and other theories, of empty domains, i.e. of domains without *existent* elements; the presuppositionless logics of Leblanc and Thomason (in Leblanc and Thomason 1968); and – when identity is added – Hintikka's systems (of Hintikka 1959) without existential presupposition; the system of Leblanc and Hailperin for singular inference (in Leblanc and Hailperin 1959). Naturally, too, classical quantification logic itself can be represented, under requisite restrictions of free and bound variables; namely, when all variables are existence-restricted, classical quantification logic results. More specifically, if $A(x_1, \ldots, x_n)$ is a wffof classical quantification logic CQ, i.e. contains only truth-functional connectives and existentially-loaded quantifiers and $x_1, \ldots, x_n$ are all the free (subject) variables in $A(x_1, \ldots, x_n)$, then $\vdash_{\mathrm{CQ}} A(x_1, \ldots, x_n)$ iff $\vdash_{\mathrm{QE}} x_1 E \ \& \ \ldots \ \& \ x_n E \supset A(x_1, \ldots, x_n)$. A corollary is that QE exactly contains the closed theses of CQ, where a wffof CQ is closed when it contains no free variables. That is, where A is a closed wffof CQ, $\vdash_{\mathrm{CQ}} A$ iff $\vdash_{\mathrm{QE}} A$. But although QE *conservatively* extends closed CQ, it does *extend* it, and this is what really counts.

Such conservative extension results are perhaps most readily proved using semantical analyses, which are of independent interest. Semantics for QE results from that already given for Q by the addition of a domain D_e, interpreted as the domain of entities, which is included in the domain D of objects. That is, a QE model is a structure $\langle T, D, D_e, I\rangle$ where $\langle T, D, I\rangle$ is a Q model and D_e is some subset of D. The evaluation

rule for constant E is then:

$$I(xE, T) = 1 \text{ iff } I(x) \in D_e.$$

Given that E is a predicate the usual extensional evaluation rule yields the result $I(xE, T) = 1$ iff $I(x) \in I(E, T)$, whence the rules coincide given the expected connection $D_e = I(E, T)$. Using this connection, an adequacy theorem for QE is an almost trivial expansion of the adequacy (i.e. soundness and completeness) theorem already stated for Q.

Since in the factual model, which reflects the way things are, Madras and Marcuse belong to $\underline{\underline{D}}_e$ but Ruritania and Protagoras do not, but belong to $\underline{\underline{D}}$, the semantical rule for E yields the correct result that existence is a property that Madras and Marcuse have but Ruritania and Protagoras do not (see further SE, pp. 251–2). [PS. Marcuse no longer belongs to $\underline{\underline{D}}_e$; Madras still does.][α]

It follows using the semantics that the thesis that every thing exists, $(Ux)xE$, is not valid, and so not a theorem of QE. A persistent objection from advocates of both classical and free logics is however that "everything exists" must be true, which implies quantifiers are always existential. The theory of QE shows that such a thesis is false; sensible and coherent non-existential interpretations of quantifiers can be given – interpretations which converge with such intuitively valid arguments as those of the form "a (e.g. Pegasus) does not exist; so something does not exist; so not everything exists". When other arguments which can be heaped up against the truth of the "Every thing exists" are added, the cumulative case against the thesis is formidable. Rescher, for example, has adduced the following simple but powerful considerations. The first argument relies on the fact "that certain things are possible, though not in fact actual or extant [, e.g.] ... while unicorns do not exist, it is perfectly possible that they might" (Rescher 1959, p. 161). That is, for some x, $\Diamond xE$ & $\sim xE$.[2] But this implies that, for some x, $\sim xE$, contradicting for every x, x exists. Moreover rejecting the fact leads to the mistaken principle $(Ux)(\Diamond xE \supset xE)$ and more generally to the "unsavoury doctrine of *a posse ad esse valet consequentia*". The second argument turns on the fact that "there are true but counterfactual existential

[α] Sylvan here uses the double underscore to indicate elements of the "factual model" (in worlds semantics, the actual world). Thus "$\underline{\underline{D}}_e$" indicates the domain of entities, i.e. items which exist, in the factual model; "$\underline{\underline{D}}$" indicates the domain of all items, existent and not, in that model. The notation is finally explained on p. 268. —*Eds.*

[2] The modal connective $\Diamond$ reads "It is logically possible that": its logic is examined shortly.

statements", e.g. "if Superman did exist, several world sporting records would be different". Consider any such statement S, which will have an antecedent of the form aE. Since S is counterfactual, $S \supset \sim aE$ whence contraposing $aE \supset \sim S$. But $(Ux)xE \supset aE$,[1] whence $(Ux)xE \supset \sim S$; that is, "the assertion of $(Ux)xE$ precludes *ab initio* the truth of any counterfactual existential statement whatsoever" (p. 162). Finally, even if it were not the case that use of the English "every" accorded with noneism, a new quantifier which did could readily be introduced, e.g. substitutionally, by way of such truths as that Pegasus does not exist.

Since "every thing exists" is false, it is true that some things do not exist. Indeed this is necessarily true, since, as we have seen and will see again, many sorts of objects cannot exist, not only inconsistent objects, but also abstractions. By contrast, the statement "some things exist" though true, and ostensively verifiable, is not necessarily true and cannot be rendered a fact of pure logic.

System QE is inadequate to express these matters. For it also follows from the semantics that "Some things exist", i.e. $(Px)xE$, which is equivalent to $(\exists x)E(x)$, is not a theorem and quite properly does not follow from $(\forall x)xE$; and that $(Px)\sim xE$, like $(Px)xE$, is not a theorem of QE. Whether these statements are valid in a system depends, in fact, on the width of the domain of objects and on the criteria for existence admitted. If properties such as nonexistence, for example, are admitted as objects then it is demonstrable in unrestricted predicate logic that something does not exist. Again, if a logic includes appropriate Characterisation Principles, it is demonstrable that various impossible objects do not exist. In the interim, however, before such principles are adduced, QE can be extended by such theses as $(Px)xE$ and $(Px)\sim xE$ – call the result QSE. A significance analogue of QSE is investigated in some detail in Slog, p. 529ff.

3. *The predicate "is possible", and possibility-restricted quantifiers* Π *and* Σ. What has just been done for existence may be repeated for possibility – and indeed for a variety of other object attributes of an ontic kind (e.g. "is imaginary", "is fictional", "is created"); and then all these things may be done at once. But first to possibility: "is possible" is a perfectly good predicate, which concatenates significantly with singular subjects

[1] It is this link of the argument, rather than $(Ux)xE$, that will be rejected by anyone inclined in the direction of free logic. But the case against free logic has already been argued.

signifying bottom order objects. For example, it is true that Pegasus is possible, but "Meinong's round square is possible" is false.

The system Q◊ (similarly QE◊, etc.) results by the addition of the one-place predicate constant ◊ to Q, or alternatively by the selection of one of the constants of Q to undertake the role of ◊. The addition of ◊ to Q increases the expressive power of the logic in much the way that the addition of E does. Likewise too, possibility-restricted quantifiers can be defined and applied to similar tasks to existence-restricted quantifiers. Thus,

$$(\Sigma x)A =_{\mathrm{Df}} (Px)(x\Diamond \,\&\, A) \quad \text{and} \quad (\Pi x)A =_{\mathrm{Df}} {\sim}(\Sigma x){\sim}A.$$

Hence $\vdash (\Pi x)A \equiv (Ux)(x\Diamond \supset A)$. It also follows, $\vdash (\Pi x)(x\Diamond \supset A) \equiv (\Pi x)A$ and $\vdash (\Sigma x)(x\Diamond \,\&\, A) \equiv (\Sigma x)A$, thus refuting the claim (of SE, p. 250) that such theses "are not derivable from relations connecting [Π and Σ] with more extensive unrestricted quantifiers of a consistent standard system". Within Q◊ various possibility-restricted logics can be represented. For example, free possibility quantification logic F◊Q, which is exactly like free logic FQ except that ◊ replaces E throughout, is included in Q◊. By a mere syntactical transformation of the argument that shows that QE is a conservative extension of FQ, Q◊ *is a conservative extension of* F◊Q. The distinctive "free" theses of F◊Q are, of course, $(\Pi x)x\Diamond$ and $t\Diamond \supset (\Pi x)A \supset A(t/x)$. The theses suggest the way in which a smaller system PQ, which captures the theses of F◊Q without ◊, can be obtained; namely replace the distinctive theses by the single axiom scheme

R2 $(\Pi x)A \supset A(t/x)$,

provided t is a consistent term. A term "t" is a *consistent* term if "t" signifies a possible object, i.e. if (as explicated in SE, p. 254) it is possible that "t" has a referent. Both Q◊ *and* F◊Q *are conservative extensions of* PQ.

The system PQE, or R* for short, which adds constant E to PQ, may like PQ itself, be axiomatised as follows, with R2 as before:

R0 $\vdash A$, where A is truth-functionally valid.

R1 $(\Pi x)(A \supset B) \supset .\ A \supset (\Pi x)B$, provided x is not free in A.

RR1 (MP) $A, A \supset B \rightarrow B$.

RR2 (Gen) $A \rightarrow (\Pi x)A$.

Thus $\underset{\sim}{\mathrm{R}}^*$ is tantamount to the system R*, investigated in SE, which is also the basis of EI and NE.[1] (Hence those investigations can be absorbed at this stage.) Since $\underset{\sim}{\mathrm{R}}^*$ can be conservatively extended, in a way required by the theory of objects, why[2] did the investigations of SE start with R* and adopt a metalinguistic restriction of substitution, as in $\underset{\sim}{\mathrm{R}}2$, instead of taking the more satisfactory course of imposing a systemic restriction on $\underset{\sim}{\mathrm{R}}2$ with $t\Diamond$ as an explicit condition? As a matter of historical fact, the original logical theory of SE was simply neutral logic QE; the paper was rewritten after early presentations to avoid apparent inconsistencies in interpretation, more explicitly, to meet the objections discussed in SE, pp. 259–60. The argument there presented – that extensions to quantifiable domains containing possibilia is the maximum admissible extension that can be made while retaining the formalism (reinterpreted of course) of standard quantification logic – is inconclusive. It depends on the assumption that impossible objects such as Primecharlie, the first even prime greater than two, really do have classically inconsistent properties, that for some predicate, f, Primecharlie f and also $\sim$Primecharlie f, thus violating the thesis $(Ux)\sim(xf \,\&\, \sim xf)$ and rendering systems such as QE inconsistent, and so (classically) trivial. It is indeed true that any system that contains radically inconsistent objects, e.g. an a such that af and also $\sim af$, has to be nonclassical in form, not just a reinterpretation of classical syntax (as SE, p. 260 begins to explain). But the argument for the assumption is inconclusive (as already explained in §10 above); it relies on some such mistaken – but very common – premiss as that impossible objects satisfy either a full characterisation postulate, in which case classical argumentation would show that both "Primecharlie is prime" and its negation are true, or else no characterisation postulate, in which case neither is true. As will become increasingly evident characterisation principles are not all-or-nothing matters; rather some predicates are assumptible and some are not. Moreover even if a characterisation principle ensures that both Primecharlie is prime and also (derivatively) that Primecharlie is not prime, it does not follow from the latter, given the distinction between predicate and

[1] There is one apparent difference between systems R* and $\underset{\sim}{\mathrm{R}}^*$, namely that R* admits instantiation in $\underset{\sim}{\mathrm{R}}2$ by *any* variables (accounted in SE "individual variables" though no such interpretational restriction is required, or makes any difference in most applications). But in a good sense any variable "is consistent", i.e. admits of replacement by a consistent constant, so a restriction to consistent variables is really no restriction (in a system which contains subject constants).

[2] To ask an apparently idiosyncratic question about one's own work, but really to raise a question of much more general interest in a particular personal setting. The question is that already considered in some detail on footnote 1, p. 110.

sentence negation, that it is not the case that Primecharlie is prime. The argument of SE accordingly fails. Naturally puzzles about inconsistent objects are not disposed of quite so easily, and the question will occur as to whether such systems as Q◊E make adequate allowance for such objects: the eventual conclusion arrived at will be that they do not (see especially §23 and chapter 5 [i.e. Vol. 2 *—Eds.*], §2) .

4. *Predicate negation and its applications*. There is, at first sight, a serious logical problem as to *what logical laws do hold for possibilia and impossibilia*? Some certainly seem to hold for both, e.g. the law of identity: if A then A. But as regards other important laws we seem to have reached an impasse. The Law of Non-Contradiction (LNC) for instance, both seems very plausible, can be impeccably defended semantically and has been adopted in Q and extensions, and yet seems to fail for impossibilia. Can we accept it as a law in any form, or should we reject it entirely? An escape can be made from this impasse – still within the framework of a consistent theory – though natural language distinctions between predicate connectives and sentence connectives, and in particular using the distinction, already indicated, between predicate negation and sentence negation. For the arguments presented in favour of abandoning such "negation" laws as LNC and the Law of Excluded Middle (LEM) only hold provided that negations of significant sentences are taken to be of just one sort, the sort represented in classical logic, and fail when that assumption is removed (as already explained, p. 115 ff).

The point and importance of predicate negation, and its generalisation internal negation, and the reasons for its introduction into the logical theory have also been explained (p. 115 ff.), through arguments from natural language, from Meinong's intuitive theory and assignments, from features of inconsistency and incompleteness of objects, and from parallels in classical theories of descriptions.[1] There is a solid case then for the introduction of predicate negation, and once it is introduced a start can be made on formulating logical principles for possibilia and impossibilia (as on p. 115). It should be emphasized that it is hardly to be expected that the primitives of classical extensional logic are adequate to the logic of the nonexistent and the intensional. It is thus a decidedly

[1] There is also firm historical basis for the distinction in traditional logical theory. As John Passmore pointed out, the article on *Negation* in Baldwin's *Dictionary of Philosophy and Psychology* 01–05 begins from a distinction between negations which deny the predicate and negations which deny the proposition. Recognition of a difference between external and internal negation goes back at least as far as Abelard, who was especially interested in the difference between *Non quidam homo est iustus* and *Quidam homo non est iustus* (see Kneale[2] 1962, p. 210).

bad argument that, since classical logic does not contain such primitives, they should not be introduced.

The negation symbol, $\sim$, already among the symbols of Q, can be enlisted to play the role of predicate negation. So there is no need to enlarge the stock of symbols of Q, and extensions so far considered, to cater for predicate negation. For the morphology of $Q^{\sim}$, Q with predicate negation, it is enough to add the formation rule:

Where h is a predicate parameter, so is $\sim h$; or, more specifically, where h^n is an n-place predicate parameter (variable or constant), $\sim h^n$ is also an n-place predicate parameter (correspondingly variable or constant).[1]

Similarly for other logics than Q. Much as $\sim A$ is the *sentence* negation of A, $\underset{\sim}{t}\sim f$ (i.e. $(t_1, \ldots t_n)\sim f^n$ for suitable n) is the *predicate negation* of $\underset{\sim}{t}f$. It would be quite possible to introduce instead of predicate negation $\sim$ an internal negation $^-$ applying to all wff(cf. p. 119). In general such an internal negation would (or could) extend the role of predicate negation from initial wffto all wff; but within the framework of logics so far considered which contain only extensional sentence connectives there is little point in resorting to internal negation.[2] However with richer logics differences appear which increase the advantages of internal negation, at the apparent cost however of losing contact with a single negation as in $Q^{\sim}$, which appears to fit in well with natural language (seen superficially, for consider the wealth of negative prefixes such an un-, dis-, etc.).

Several principles which hold for sentence negation, e.g. LNC and LEM, fail when recast in terms of predicate negation (p. 115 ff.); so too then do Carnap's proposals for reducing predicate connectives to sentential ones (MN and elsewhere). However an important question for the logic, and semantics, of $Q^{\sim}$ (and generally for logic $L^{\sim}$) is which principles hold for predicate negation. The hardest principles, which appear impervious to counterexamples, are double negation laws

DN$^{\sim}$. $\quad \underset{\sim}{t}\sim\sim h \equiv \underset{\sim}{t}h.$

[1] Use of a schematic formulation of Q comes to matter. With a finite axiom formulation, e.g. a neutral version of Church's system $\mathrm{F}_2^{1\mathrm{p}}$ of Church 1956, p. 218 ff ., it would be necessary to reformulate the logical structure, to complicate the rule of substitution for predicate variables.

[2] Using predicate negation *an* internal negation can be defined for $Q^{\sim}$, as follows: where A is an initial wff $\underset{\sim}{t}f$, $\bar{A}$ is $\underset{\sim}{t}\sim f$; where A is of the form $\sim B$, $\bar{A}$ is B; where A is of the form $B \,\&\, C$, $\bar{A}$ is $\bar{B} \vee \bar{C}$; etc.

While many examples appear to support forms of contraposition, e.g.

$$\text{CP}^{\sim}. \quad \underset{\sim}{t}{\sim}f \supset \underset{\sim}{u}{\sim}g \equiv .\ \underset{\sim}{u}g \supset \underset{\sim}{t}f,$$

and thus its specialisation $\underset{\sim}{t}{\sim}f \supset \underset{\sim}{t}{\sim}g \supset .\ \underset{\sim}{t}g \supset \underset{\sim}{t}f$, the principles are in doubt for at least these reasons, and so should be rejected. Firstly, CP$^{\sim}$ amounts to ${\sim}\underset{\sim}{t}{\sim}f \vee \underset{\sim}{u}{\sim}g \equiv .\ \underset{\sim}{t}f \vee {\sim}\underset{\sim}{u}g$. Since $\underset{\sim}{t}f$ and $\underset{\sim}{u}g$ can vary independently, such an equivalence could be true only if there were connections, equivalences or at least material implications, between respective components of the equivalence, e.g. ${\sim}\underset{\sim}{t}{\sim}f$ and $\underset{\sim}{t}{\sim}f$. But requisite connections between such components fail, as we have seen; ${\sim}\underset{\sim}{t}{\sim}f$ neither implies nor is implied by $\underset{\sim}{t}f$. Secondly, from the positive paradox, $A \supset .\ B \supset A$,[1] it follows, $x{\sim}f \supset .\ y{\sim}g \supset x{\sim}f$. Thus applying CP$^{\sim}$, $x{\sim}f \supset .\ yg$ results. But now for any impossibilium x some property λf can be found such that xf is true and $x{\sim}f$ is also true. So, for instance, it follows by substitution: mrs ${\sim}$round $\supset .$ mrs round $\supset .\ yg$, whence, by detachment of truths (namely (1) and (2) of p. 60), yg is true. The upshot is that with CP$^{\sim}$ the logic would be absolutely inconsistent. Damaging consequences also follow using the special case in place of CP$^{\sim}$; for example it then follows that any impossibilium possesses all properties![2] As similar methods show, several other negation principles fail for predicate negation, e.g. reductio, antilogism, disjunctive syllogism. The main condition constraining predicate negation appears then to be double negation, which will be taken as sole axiom scheme for predicate negation.

$Q^{\sim}$ is axiomatised then by the postulates of Q together with DN. Similarly extensions of Q such as QE, simply add DN as a postulate. The elementariness of the new axiom makes it easy to enlarge the semantics for Q (or its extensions) to include predicate negation. On the first and simplest method, $t{\sim}^n f$ (with $n \geq 1$ and parameter f containing no occurrences of ${\sim}$) is assigned arbitrarily subject to the restrictions that

[1] The second reason really puts the first in more damaging form, that the usual justification for classical principles with (sentence) negation breaks down for predicate negation. Thus, e.g., the outcome of $A \supset .\ B \supset A$, namely $x{\sim}f \supset .\ xf \supset q$, no longer has the usual vindication got by replacement of material implication by alternation and negation. For it becomes under replacement: ${\sim}x{\sim}f \vee .\ {\sim}xf \vee q$. Since ${\sim}x{\sim}f$ does not reduce to xf the formula does not hold generally.

[2] The damage is really done by a *combination* of the contraposition principles with material connectives. Thus if contraposition principles, which have some appeal and support, are to be retained, then (as argued in RLR), material implication cannot be retained without very ugly consequences. There is, however, no problem in dispensing with material implication; for material implication is so implausible in so many directions as more than a necessary condition on a satisfactory implication that there are many independent reasons for displacing it from its usual prominent position.

where n is even $t{\sim}^n f$ is assigned the same value as $\underset{\sim}{t}f$ and where n is odd and greater than 1 $\underset{\sim}{t}{\sim}^n f$ is assigned the same value as $\underset{\sim}{t}{\sim}f$. $\underset{\sim}{t}{\sim}^n f$ is of course defined recursively, e.g. thus $\underset{\sim}{t}{\sim}^1 f =_{\mathrm{Df}} \underset{\sim}{t}{\sim}f$; $\underset{\sim}{t}{\sim}^{n+1} f = \underset{\sim}{t}{\sim}({\sim}^n)f$. The assignment method is effective since n is always finite. What all this amounts to then is that $\underset{\sim}{t}{\sim}f$ is assigned independently of $\underset{\sim}{t}f$, as if it were an initial wff, and wffcontaining interated occurrences of predicate negation are reduced respectively to $\underset{\sim}{t}f$ or $\underset{\sim}{t}{\sim}f$ according as the number of negation signs is even or odd.

To sum it up more satisfactorily, in truth-value semantics, $I(\underset{\sim}{t}{\sim}h, T) = 1$ or 0 according as the model assigns, just as for initial wff, subject only to the requirement that $I(\underset{\sim}{t}{\sim}{\sim}h, T) = I(\underset{\sim}{t}h, T)$. As before, in objectual semantics, $I((t_1, \ldots, t_m){\sim}h, T) = 1$ iff $\langle I(t_1), \ldots, I(t_n)\rangle \;\; \iota \;\; I({\sim}h, T)$, where $I({\sim}h, T)$ is assigned by the model just as for $I(f, T)$, unnegated f, the requirement being that $I({\sim}{\sim}h, T) = I(h, T)$.

A second and more flexible semantics, which removes any numerical aspect (through an involutory function which takes over their role), is provided by the T method. To the models (or model structures) of the underlying logic, e.g. Q, QE or whatever, an operation † is added, subject to the involutory requirement that $a^{\dagger\dagger} = a$ where a is any element formed from T by application of operation †. Thus, for example, a $Q^{\sim}$ model is a structure $\langle T, \dagger, D, I\rangle$ with † an operation (on T and † successors) such that $a^{\dagger\dagger} = a$. Since $a^{\dagger\dagger} = a$ the model is really a two-worlds one with worlds T and $\bot = T^{\dagger}$; and using model $\langle T, \bot, D, I\rangle$ simplifies the interpretation rules. Initial assignments are made, as for the underlying logic, only to negation-free wff. But initial wffare assigned values, independently, at both T and $\bot$. The further evaluation rules for operators of the underlying logic are as before, the rules applying only at T. The additional rules for predicate negation are as follows:

$I(\underset{\sim}{t}{\sim}h, T) = 1$ iff $I(\underset{\sim}{t}h, \bot) \neq 1$
$I(\underset{\sim}{t}{\sim}h, \bot) = 1$ iff $I(\underset{\sim}{t}h, T) \neq 1$

Adequacy proofs are enlargements of those for the underlying logic. Consider the first semantics,

ad Soundness: It suffices to validate DN$^{\sim}$, for which it suffices to show in an arbitrary model that $I(\underset{\sim}{t}{\sim}{\sim}h, T) = 1$ iff $I(\underset{\sim}{t}h, T) = 1$. But this is immediate from the assignment rules; for in the objectual case

$I(\underset{\sim}{t}\sim\sim h, T) = 1$ iff $\langle I(t_1), \ldots, I(t_n)\rangle \ \iota \ I(\sim\sim h, T)$, i.e. i ff$\langle I(t_1), \ldots, I(t_n)\rangle \ \iota \ I(h, T)$, i.e. iff $I(\underset{\sim}{t}h, T) = 1$, where $\underset{\sim}{t} = \langle t_1, \ldots, t_n\rangle$, since $I(\sim\sim h, T) = I(h, T)$.

ad Completeness: The completeness proof is as for the underlying logic, and this enables the requirement $I(\underset{\sim}{t}\sim\sim h, T) = I(\underset{\sim}{t}h, T)$ to be established whence $I(\sim\sim h, T) = I(h, T)$ will follow. For $I(\underset{\sim}{t}\sim\sim h, T) = 1$ iff $\underset{\sim}{t}\sim\sim h \in T$ and $I(\underset{\sim}{t}h, T) = 1$ iff $\underset{\sim}{t}h \in T$. But as T is closed under material implication and contains all theorems, by DN$^\sim$,

$$\underset{\sim}{t}h \in T \text{ iff } \underset{\sim}{t}\sim\sim h \in T.$$

Consider now the second semantics.

ad Soundness: As in the first case it suffices to show generally that $I(\underset{\sim}{t}\sim\sim h, T) = 1$ iff $I(\underset{\sim}{t}h, T) = 1$. But $I(\underset{\sim}{t}\sim\sim h, T) = 1$ iff $I(\underset{\sim}{t}\sim h, \perp) = 1$, i.e. i ff$I(\underset{\sim}{t}h, T) = 1$.

ad Completeness: T is constructed as for the underlying logic; similarly D and I are as before except that it is also specified that $I(\underset{\sim}{t}h, \perp) = 1$ iff $\underset{\sim}{t}h \in \perp$, where $\perp$ is defined as the class of wffof the form $\underset{\sim}{t}h$ such that $\underset{\sim}{t}\sim h \notin T$. Hence $\underset{\sim}{t}h \notin \perp$ iff $\underset{\sim}{t}\sim h \in T$. It su ffi ces, given the completeness argument for the underlying logic to verify the evaluation rules for predicate negation. There are two cases.

(i) $I(\underset{\sim}{t}\sim h, T) = 1$ iff $\underset{\sim}{t}\sim h \in T$ iff $\underset{\sim}{t}h \notin \perp$ iff $I(\underset{\sim}{t}h, \perp) \neq 1$;

(ii) $I(\underset{\sim}{t}\sim h, \perp) = 1$ iff $\underset{\sim}{t}\sim h \in \perp$ iff $\underset{\sim}{t}\sim\sim h \notin T$. But $\underset{\sim}{t}\sim\sim h \notin T$ iff $\underset{\sim}{t}h \notin T$, by DN$^\sim$. And $\underset{\sim}{t}h \in T$ iff $I(\underset{\sim}{t}h, T) = 1$.

Evidently $\perp$ has a very limited role in the second semantics. It is better adjusted to the treatment of internal negation, which applies to all wff. Also the method is better suited to, and comes into its own in, the intensional scene which usually begins with infinitely many worlds, so that † can be directly defined without any need to form a sequence of worlds beginning with T (see below, and also RLR, chapter 7). The method is much more flexible than that of the first semantics in that it can readily accomodate further axiomatic conditions on predicate negation. But it is easy to see from the semantics that proposed principles such as CP$^\sim$, which get duly falsified by countermodels, are undesirable. A countermodel to $x\sim f \supset y\sim g \supset .\ yg \supset xf$ is obtained by searching for a falsifying situation. Thus suppose it is false in a model; what is that model like? Well, $I(x\sim f \supset y\sim g, \perp) = 1$ and $I(yg \supset xf, T) \neq 1$, so $I(yg, T) = 1 \neq T(xf, T)$. And either $I(x\sim f, T) \neq 1$ or $I(y\sim g, T) = 1$, i.e. $I(xf, \perp) = 1$ or $I(yg, \perp) \neq 1$.

But, in truth-valued semantics such assignments are perfectly admissible. Choose I then so that it gives such assignments; the resulting model falsifies CP$^{\sim}$.

This completes the elementary logic of predicate negation: the logic is however elaborated upon in subsequent sections, e.g. it is linked with property and attribute negation in §18 and synthesized with internal negation in §23. The main applications of predicate negation have already been indicated (p. 115 ff.), but the main point bears repetition.

Predicate negation is fundamental in the (consistent) theory of items for the characterisation of inconsistency and incompleteness, and thus in the determination of what is impossible and what merely possible. Inconsistency and incompleteness, with respect to predicate negation,[1] are defined thus:

x is inconsistent wrt $f =_{\mathrm{Df}} xf \;\&\; x{\sim}f$.

(As always "wrt" abbreviates "with respect to".) Similarly defined are: xf is inconsistent and f is inconsistent at x.

x is incomplete wrt $f =_{\mathrm{Df}} {\sim}xf \;\&\; {\sim}x{\sim}f$.

Similarly defined are: xf is incomplete and f is incomplete at x.[2] Evidently x is inconsistent [indeterminate or incomplete] if x is inconsistent [incomplete] wrt *some* (extensional) f. But saying this in the theory requires quantification over predicates, which exceeds first-order resources. There are resource inadequacies nearer home. For example, it is a logically significant question, preanalytically, whether if xf is incomplete its negation ${\sim}xf$ is also. But the definition given does not permit us to pursue it; for ${\sim}xf$ is incomplete is not defined. Of course we could define it separately, but what is really wanted is a single definition that extends to it and other cases without further definitional ado.

[1] Parallel notions may be defined with respect to other operators. There are of course further sorts of incompleteness and inconsistency than purely negation types: ω-inconsistency (p. 124) is one, and various sorts of ω-incompleteness and ω-indeterminacy may be defined.

[2] Though there is sometimes point in separating incompleteness and indeterminacy – similarly inconsistency and overdeterminacy – commonly no separation is made and often the terms are used interchangeably. The following terminology is however appealing: an object is indeterminate if it is incomplete in some respect.

Once the logic of these notions is better understood however, and important differences emerge more clearly, there will be point in regular separation. For example, there is one incompleteness determinate such that the complement of an incomplete object is inconsistent (e.g. worlds a and a^*), but there is another important incompleteness determinate such that the complement of an incomplete object is incomplete.

Since this can be achieved with internal negation, it is another reason for considering generalising from predicate to internal negation, i.e. to introducing a connective – (as on p. 119) subject to the semantical rule: $I(\bar{A}, a) = 1$ iff $I(A, a^\dagger) \neq 1$. Such a connective is included in the richer logics of later sections (especially §23).

The connection between the joint falsity of contraries and nonexistence was observed by Aristotle though in the context of a different theory. Concerning the contraries "Socrates is well" and "Socrates is ill" (i.e. "Socrates is not well"), Aristotle said (*Categories*, 10, 14a12 f.),

> if Socrates exists, one will be true and the other false, but if he does not exist, both will be false; for neither "Socrates is ill" nor "Socrates is well" is true, if Socrates does not exist at all.

Elaboration of the logical interconnections between negation and existence and possibility leads directly to a more sophisticated treatment of both existence and possibility, to the second stage account of §19.

5. *Descriptors, neutral choice operators, and the extensional elimination of quantifiers.* Just as important as quantifiers, but by comparison neglected in modern logical theory, are descriptors. Whereas in standard logic quantifiers are sentence (or wff) forming on sentences (or wff), descriptors are subject forming on sentences or wff. But in natural languages such as English that neat distinction is eroded; both types of operators apply to general terms to yield subjects. For example, "some", sometimes taken as a paradigmatic quantifier, applies to singular or plural terms to (e.g. "man" or "men") to yield a singular or plural (indefinite) subject. Better representatives of natural language quantifiers (though of course no variables are involved) are "there is (a)", "there exist" and, differently, "something (is a)" and "every object (is a)"; but some of these (e.g. "something") are made up from descriptors. Perhaps indeed all quantifiers can be defined in terms of descriptors? So it proved to be in the case of classical extensional logic: the main quantifiers can be defined in terms of one very important descriptor, Hilbert's epsilon operator or choice symbol.

The role and importance of descriptors, especially in ordinary discourse, and so in any logical theory that aims to reflect and work out the logic(s) of ordinary discourse, is explained in Slog, (p. 151ff., p. 553ff.) and also in PLO, (p. 156ff.) which at the same time indicates how a neutral choice operator gets into the picture; the logic and

role of Hilbert's epsilon ε is well explained with its original presentation in Hilbert and Bernays 1934–39, but briefer expositions may be found in Kneebone 1963, (p. 100ff.) and Wang 1963, (p. 315ff.), while the Hilbert consistency programme using ε is explained in Kleene 1952. Hilbert's epsilon operator itself is not what is wanted or sought in a theory of items; for it is existentially-loaded, as is shown, firstly by the definition of the existential quantifier $\exists$ in terms of ε (thus: $\exists xA =_{\mathrm{Df}} A(\varepsilon xA)$), and secondly by the intended interpretation of $\varepsilon xA(x)$, as an arbitrarily selected entity which is A if there exists one and an arbitrarily selected entity otherwise (cf. Asser 1957). What is sought as a basic operator is a neutral analogue of Hilbert's operator, and such is provided by the xi, ξ, operator (studied in Routley 1969, Slog, p. 554ff. and especially PLO, p. 181 ff.).[1]

A logic $L\xi$ *with choice* results from earlier logics such as SQ, Q, QE, QE$^{\sim}$ by addition of a term-forming operator ξ. That is to say, ξ is added as a primitive symbol, and is subject to the formation rule: where A is a wffand x a subject variable, then ξxA is a wf term (and occurrences of x in ξxA are bound). $L\xi$ has just one axiom scheme beyond those of L, the xi scheme

Aξ. $\quad B(t/x) \supset B(\xi yB(y/x)/x)$, or for short, $B(t) \supset B(\xi yB)$.[2]

The point of the baffling substitution notation is two-fold: to facilitate change of variables bound by ξ, and to ensure that variables are not illegitimately bound up upon substitution. Aξ tells us that where B holds for some term t then it holds for *any* object (an arbitrarily selected item) which is B. It is such construals of Aξ, along with the intended interpretation, that encourage the reading of ξ as "any". But really ξ is an artificial determinate of the English determinable "any", in something the way that P and U are of corresponding English quantifiers.

Since the logic and semantics of ξ are presented in requisite detail elsewhere (see, e.g., texts already cited) it is enough to summarise the more remarkable features and results. Firstly, ξ enables the definition and elimination of quantifiers. Neutral quantifiers may be defined in terms of ξ as follows: $(Px)B =_{\mathrm{Df}} B(\xi xB)$; $(Ux)B =_{\mathrm{Df}} {\sim}(Px){\sim}B$.

[1] By good fortune what started life supposedly as an epsilon symbol was interpreted by typists as a xi symbol. So do we profit from error.

[2] Note that since descriptor ξ binds variables, the explanation of $B(t/x)$ is extended to include such bindings by descriptors. The substitution notation is fully explained in Routley 1969.

Then where L is a zero-order logic (e.g. SQ), $L\xi$ (with quantifiers defined as above) includes LQ; e.g. SQξ includes Q, i.e. if A is a theorem of SQξ then A is a theorem of Q. Correspondingly, in Qξ the above definitions are provable in equivalential form, e.g. $(Px)B \equiv B(\xi xB)$ is a theorem of Qξ. More striking than the extension results, is that the extension is a conservative one, e.g. SQξ conservatively extends Q, that is where A is a wffof Q, A is a theorem of SQξ (with quantifiers defined) iff A is a theorem of Q. This is a neutral version of part of the substance of the second epsilon theorem.[1] The corresponding part of the first epsilon theorem is that SQξ is a conservative extension of SQ, that is the addition of ξ does not deliver any new purely sentential or zero-order results.

The simplest proofs of ξ theorems make use of semantics of ξ logics, which there is independent point in considering. Intuitively, $\xi xA(x)$ is an arbitrarily chosen item of the domain given satisfying $A(x)$ if some item does satisfy A. The problem is, what assignment to make, if any, if no item satisfies A; and what succeeds is the following: an arbitrarily chosen item of the domain.[2] These assignments can be spruced up formally by adding to modellings a choice function c, as now illustrated in the case of SQξ. An SQξ model M is a structured set $M = \langle T, D, c, I\rangle$ where T and D are as before, and c is a choice function over D such that for each non-null subset D' of D, $c(D')$ is an item of D' and such that otherwise $c(D') = c(\Lambda) = c(D)$. Interpretation I is as before but there is an additional clause for ξ terms, namely

$$I(\xi xA) = c\{I(x) : I(A, T) = 1\}.$$

Validity, satisfiability, and so on, are defined in the usual way (e.g. as in §§15–16). Expected adequacy theorems, Skolem–Lowenheim theorems, compactness theorems, and so forth now follow for SQξ, SQEξ, Qξ, QEξ, etc. (Main details may be found in Routley 1969, p. 148ff.; three valued versions of the results are presented in Slog, p. 55ff.; and intensional versions in PLO, p. 190ff.) The adequacy theorems may be applied to yield the neutral versions of Hilbert's epsilon theorems stated above.

[1] The full second epsilon theorem applies not only to quantification logic *and* quantification logic with identity but to certain quantificational theories.

[2] It is not necessary to make an assignment: Henkin in Henkin 1950 does not.

Note that in neutral logic it is not really necessary either to exclude null domains. The null set can be pressed into service in such cases, if in a somewhat Alice-in-Wonderlandish way. In particular, if $D = \Lambda$, $c(D) = \Lambda$.

Just as existentially-loaded quantifiers can be defined in neutral quantification logic with existence – only they satisfy the more liberal free logic, and not classical logic, except where domains are existentially-restricted – so a Hilbert epsilon operator can be defined in neutral choice theory with existence – only it will conform to a more liberal free epsilon theory, which only reduces to the Hilbert theory where domains are artificially existentially restricted. Just as $\exists$ is defined: $(\exists x)A =_{\text{Df}} (Px)(xE \,\&\, A)$, so ε is defined: $\varepsilon xA =_{\text{Df}} \xi x(xE \,\&\, A)$. The principles which govern ε, namely

$\varepsilon 1.$ $\quad A(x) \,\&\, xE \supset .\ A(\varepsilon xA)$

(cf. FEG), and

$\varepsilon 2.$ $\quad A(x) \,\&\, xE \supset .\ (\varepsilon xA)E,$

follow at once from Aξ, upon taking $B(x)$ as $A(x) \,\&\, xE$. It is evident from the way ε can be interpreted that ε coincides with Hilbert's operator. For εxA signifies an arbitrarily chosen entity which satisfies A provided there exists an element satisfying A.[1]

The logic SQξ, obtained by the addition of $\varepsilon 1$ and $\varepsilon 2$ to zero-order logic SQ, does not however neatly include free quantificational logic, something that might at first be expected. For although the FEG scheme $A(x) \,\&\, xE \supset (\exists x)A$ follows at once from $\varepsilon 1$ upon defining $(\exists x)A =_{\text{Df}} A(\varepsilon xA)$, the other characteristic free axiom, $(\forall x)xE$, i.e. $\sim(\exists x)\sim xE$, does not follow. On the contrary, since it amounts to $(\varepsilon x\sim xE)E$ (i.e. under translation $(\xi x(xE \,\&\, \sim xE))E$), countermodels are easily supplied in domains which include nonentities. Of course free logic is recoverable in SQEξ in the usual way (e.g. as in §16).

Because ξ logics enable the elimination of quantifiers by way of terms they facilitate quantificational deductive procedures, especially natural deduction techniques which rely on arbitrarily selected terms satisfying given conditions (hence the simple natural deduction systems of Routley 1969); for similar reasons they often simplify tasks, such as proving consistency of theories, where quantifiers cause problems. ξ terms also prove to be important in explaining or defining other descriptors such as "the" (see §22) and in

[1] The Henkin interpretation previously mentioned is here exploited.

formulating distinctive logical principles of the theory of items, namely Characterisation Principles (§21).

Despite the big advantages of ξ terms, and the attractiveness of the theory they lead to, such terms make for serious difficulties in intensional logics (as will become evident subsequently). But logical development of the theory of objects soon forces us to intensional logics.

6. *Identity determinates, and extensionality*. The standard logical theory of identity can of course be adjoined to any of the logics already studied. Since identity cannot be defined in first-order quantification logics, identity predicates have either to be introduced as further predicates or two-place predicate constants have to be singled out to do the jobs.

The postulates on Leibnitz identity, $\approx$, are entirely standard; they are

$\approx$1. $u \approx u$

$\approx$2. $u \approx v \supset .\ A(u) \supset A(v)$, where u and v are subject terms and $A(v)$ results from $A(u)$ by replacing one (derivatively zero or more) occurrence of u by v, and this occurrence is not within the scope of quantifiers or descriptors binding (variables in) u or v (*proviso I*).

It is enough to state scheme $\approx$2 for initial wffsince the full scheme can be recovered by an inductive argument.

To extend the semantics already given to cover Leibnitz identity, requires only an evaluation rule for $\approx$, and in objectual form[1] it is as follows:

$I(t_1 \approx t_2, T) = 1$ iff $I(t_1)$ is the same (object) as $I(t_2)$, i.e. $I(t_1)$ and $I(t_2)$ are Leibnitz identical.

The rule is splendidly circular in its own way, but adequate. Proofs of adequacy are orthodox elaborations of those already indicated for the logics to which identity is added: soundness is straightforward, while completeness typically uses an equivalence class method.[2]

[1] By comparison, the rule in substitutional or truth-valued form is disagreeably complex. Substitutional semantics are ill-adapted for the semantical analysis of substantial parts of speech.

[2] For details see, e.g. Slog, p. 534ff., where features, and shortcomings, of Leibnitz identity are also discussed, especially, p. 606ff.

The important identity determinates are extensional, strict and coentailmental determinates, not Leibnitz identity. In limited contexts such as those of extensional or modal logic (contexts logicians and some mathematicians confine themselves to), Leibnitz identity can stand in for an important determinate. Hence its usefulness. It has too a role as an ideal limit, the limit as more and more restrictions on intersubstitution are removed. But for philosophical purposes, and for the logical analysis and assessments of ordinary discourse and arguments, neither of which are confined to the extensional or modal and are rarely so restricted, Leibnitz identity is not important, but indeed a major hindrance, particularly when presented, as classical logicians and exponents of the Reference Theory like to present it, as the one true identity.

Nothing (except an explicit interpretational restriction) bars the interpretation of predicates of quantification logic as intensional predicates. Under such circumstances, extensional identity cannot be equated with Leibnitz identity, even in the relatively impoverished language of Q$\approx$ (i.e. quantificational logic with Leibnitz identity). The question arises: How in such a setting can extensional identity be introduced in a not merely interpretational fashion? There is no prospect of splitting intensional predicates into two components, an intensional connective combined with an extensional predicate, as is commonly done in modal logic, since the language has no place for intensional connectives. One evident course is to divide predicates into two classes, extensional and not, but better than two sets of primitive predicates is the introduction of one further predicate (of predicates) ext, abbreviating "the predicate '. . . ' is extensional", and conforming to the formation rule: iff f^n is a predicate then ext(f^n) is a wff. Strictly the predicate ext exceeds the resources of first-order logic; but the violation is minor, and could be removed (e.g. by pretending that ext is a special subject).

Predicates are not only extensional, or not *in toto*, but, where the predicates are of more than one-place, extensional or not in each place. Whether a predicate is extensional in a given place is often important for whether identity replacement can be made within it. Accordingly ext is superseded by ext_i, extensional in the ith place. Where f^n is an n-place predicate and $l \leq i \leq n$ then $\text{ext}_i(f^n)$ is a wff. Ext is then defined as complete extensionality, thus $\text{ext}(f^n) =_{\text{Df}} \text{ext}_1(f^n)$ & . . . & $\text{ext}_n(f^n)$.

Ext may be extended to all wff(e.g. of Q) recursively as follows: ext($\sim A$) iff ext A; ext(A & B) iff ext A and ext B; ext($(x)A$) ifffor every x, ext(A). These rules reflect what

can be proved given definitions of extensional for functions of functions (see, e.g. 10.1), e.g. $\text{ext}(A \;\&\; B) \equiv \text{ext}\, A \;\&\; \text{ext}\, B$; etc. It follows that in Q, for instance, intensionality only enters at the level of predicate expressions: for the remainder, the logic, and its connectives and quantifiers, are already extensional.

Extensional identity, $=$, conforms to the formation condition: where u and v are subjects terms $(u = v)$ is a wff. The basic extensional identity axioms are

$=$1. $\quad u = u;$

$=$2B. $\quad u = v \;\&\; \text{ext}_i\, f^n \supset .\; (\ldots u \ldots)_{i^{\text{th}}\text{ place}} f^n \supset (\ldots v \ldots)_{i^{\text{th}}\text{ place}} f^n,$

i.e. where f^n is extensional in the ith place, intersubstitution can be made at that place. A scheme corresponding to the scheme adopted for Leibnitz identity can now be derived inductively:

$=$2. $\quad u = v \supset .\; A(u) \equiv A(v)$, subject to the requirements of proviso (I) and the further requirement that the occurrence of u replaced is not within a nonextensional place of a predicate (*proviso II*).

Roughly, replacements of extensional identity preserves truth given that replacements are limited to extensional places.

In order, however, that such fundamental properties of identity as symmetry and transitivity be derived, a further postulate is required, namely

$=$3. $\quad \text{ext}(=).$

Otherwise replacements of extensional identicals within identity contexts themselves is not legitimated. Given $=$3, symmetry and transitivity do follow using $=$2 and, in case of symmetry, $=$1. Similar postulates are required for other predicate constants, e.g. where E is present,

$=$4. $\quad \text{ext}(E).$[1]

When the logic contains descriptors such as ξ, further extensionality principles may suggest themselves, in particular, $A \equiv B \supset .\; \xi\, xA = \xi xB$, and variants thereof. But the principle is false, for the same reason as its derivative for definite descriptions already rejected in 1.14. Moreover the semantical theory affords countermodels to such principles.

[1] Where functions are separately included in the logic axioms like $=$2B will be needed.

But which predicates, it will be demanded, are extensional in which places? A good feel for which predicates are extensional and which are not can be given by way of examples. But can a distinguishing principle be found, or something more systematic given which reduces the need for lists of postulates? An informative answer might be hoped for from the semantical theory developed, but is not forthcoming. For at best rather trivial semantics for ext can be provided in the extensionally-biased semantical framework for Q and extensions thus far considered, e.g. $I(\text{ext}\, f, T) = 1$ iff f is extensional. For a less trivial semantics a more substantial semantical theory is required – a semantical theory invaluable in many other places – that for intensional logics.

7. *Worlds Semantics: introduction and basic explanation*. An explanation of worlds semantics is an essential prerequisite both for the informal theory elaborated subsequently and for the more formal semantical theory that can be appealed to in underpinning and clarifying the less formal theory. Since the time has come to introduce quantified modal logics and their semantical analysis in terms of possible worlds, a good time has come to interpose this basic explanation.

A world is an object, of a certain sort: it has certain domains, it stands in certain relations, for instance to other worlds. Most important, it is an object where statements (represented syntactically by declarative sentences) hold, or fail. The basic semantical relation, *(that) A holds at (or in) world c* is symbolised, in terms of η, *holding at*, $A\ \eta\ c$, or in terms of the *on*[e]ness of an interpretation function, thus: $I(A, c) = 1$. Here η will be taken as fundamental, and I defined: $I(A, c) = 1 =_{\text{Df}} A\ \eta\ c$. I is a function from Wff $\times$ Worlds to holding values $\{1, 0\}$, i.e. from wffand worlds to holding values. I is certainly a function, since if $A = B$ and $c = d$ then $A\ \eta\ c$ iff $B\ \eta\ d$. Hence $I(A, c) \neq 1$ iff $A\ \not\eta\ c$: $I(A, c) \neq 1$ can be read, in the assumed two-valued semantical framework, where it is equated with $I(A, c) = 0$, A does not hold at c.

The interpretation function I – which in a weak sense does interpret wffat worlds – is expected to satisfy further conditions, ideally conditions which enable $I(A, a)$ to be inductively defined through initial cases, i.e. cases of the form $I(C, d)$ where C is an initial (or atomic) wff. The requirements for the (complete) possible worlds of modal logics make satisfaction of the inductive conditions easy, at least for $\&$–$\vee$–$\sim$ system. Specifically, a world c is a *(complete) possible world* ifffor every wff A and B:

$\sim A\ \eta\ c$ iff $A\ \not\eta\ c$, i.e. $\sim A$ holds at c iff A does not hold at c (the completeness and consistency requirements, of the classical negation rule)

$(A\ \&\ B)\ \eta\ c$ iff $A\ \eta\ c$ and $B\ \eta\ c$ (normal &-rule)

$(A \vee B)\ \eta\ c$ iff $A\ \eta\ c$ or $B\ \eta\ c$ (normal $\vee$-rule).

Worlds may be *represented* through the sets of wffthat hold in them. Given such a representation, the rules for possible worlds may be rewritten as membership rules, simply by replacing "η" throughout by "$\in$" (thus, e.g., the worlds of Hintikka developed from the state descriptions of Carnap).

Possible worlds, despite their prominence in recent semantical analysis, are a rather special class of worlds.[1] Subsequently (in §24) a rich variety of worlds that are neither complete nor possible will be considered. A most important subclass of these worlds consists of the worlds which differ from possible worlds only in removing one or both of the qualifications to completeness or possibility. Such are, in essentials, the normal worlds of relevant and entailment logics (discussed in §23).

Worlds, other than the actual world,[2] do not exist. There exists no world where poverty is abolished, no world where most of our lives are not organised in large measure in the interests of some form of capitalism, no world where the oceans and rivers are unpolluted. But many alternative worlds, none of which exist, have these desirable features. Of course alternative worlds are not featureless though none of them exist. Worlds are an important and clear example of objects which do not exist which are very useful theoretically. Since they do not exist, alternative worlds are neither discovered (e.g. through special long-range telescopes) nor stipulated (e.g. like names); thus the dispute between Lewis and Kripke (cf. Kripke 1971 and 1972) about the character of possible worlds, over whether they are platonistically or conventionalistically discerned, presents a false contrast, based on a mistaken existence assumption. For similar reasons the many attempts to reduce alternative worlds to something else that does exist, in order to limit ontological commitments, are misguided.[3]

[1] An accurate history of the use and role of possible worlds and of modal logic semantics has yet to be written. What is clear enough is that such a history would differ substantially from the presently received picture.

[2] Whether the actual world exists depends on its further representation. As an abstract set of propositions it does not exist; reduced to an appropriately interrelated sum of things that exist it does exist.

[3] World reduction is a special case of object reduction, a matter further discussed in 12.3 [reprinted in Vol. 3 *—Eds.*].

Among worlds the *factual world* T is especially important for the theory of truth (and also pedagogically) – even if T is usually eliminable in modal semantics. The factual world is of course such that just what is true holds at it: that is (applying a Tarski scheme of the form Tr A iff A), for every A,

$A \; \eta \; T$ iff A. Indeed subsequently *truth* will be defined in terms of holding at T, i.e. (that) A is true iff $I(A, T) = 1$.

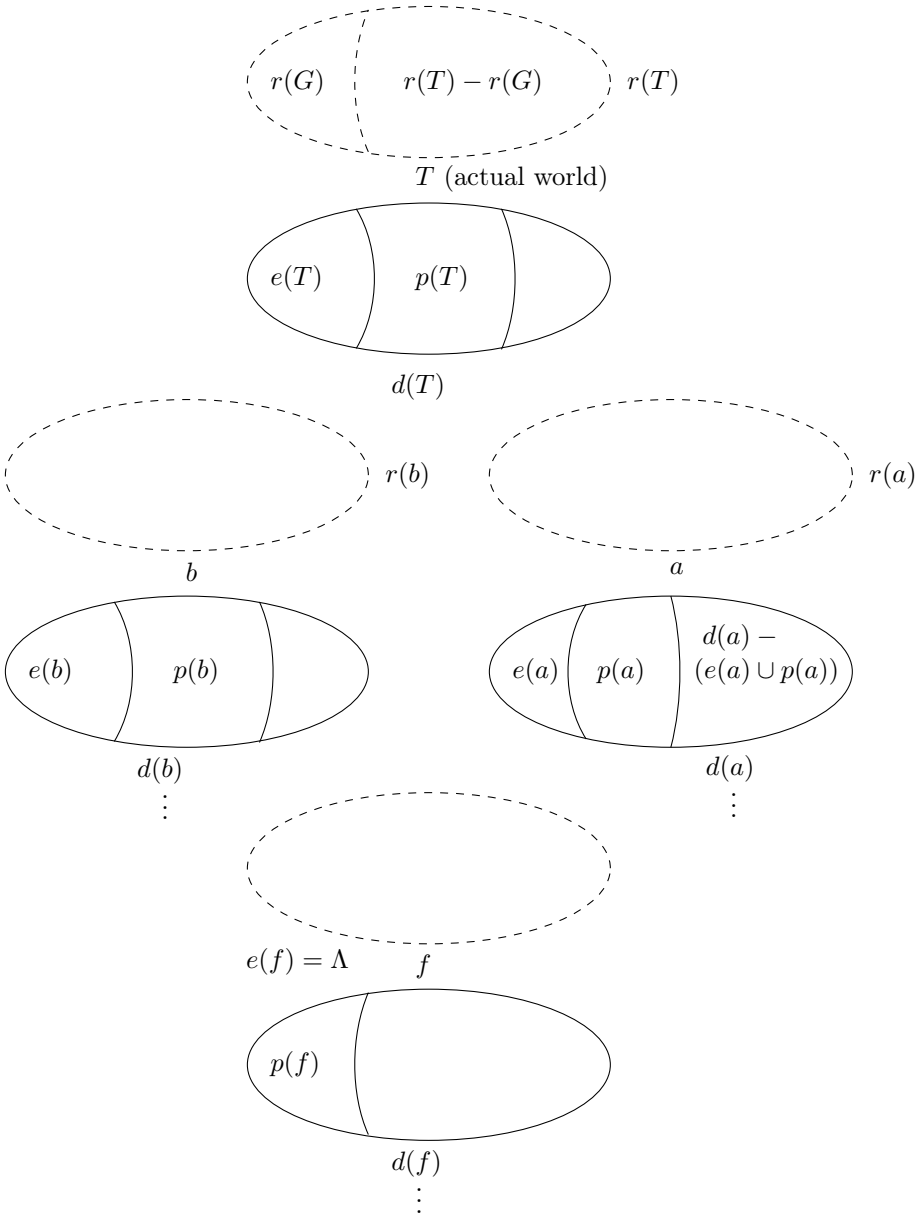
Worlds may be interrelated in many ways. For example, world a may include world b, i.e. $b \leq a$, which happens if and only if for every C, if $C \; \eta \; b$ then $C \; \eta \; a$. But there are many many other relations that worlds may stand in. A two-place relation R between worlds may be any suitable sort of relation: similarly for relations of more than two-places. For example, the semantics of modal logic S5 can be expressed using an equivalence relation R on worlds (i.e. a relation that is reflexive, symmetric and transitive); but it turns out that the relation can be eliminated by a slight adjustment of semantics.

A world a may have various domains (associated with it), in particular the things of the world, i.e. the domain $d(a)$ of objects. These domains will include various subdomains of importance, in particular $d(a)$ will include the subdomain $e(a)$ of entities of a, and also a subdomain $p(a)$ of mere possibilia of a. Pictorial representation of worlds is helpful in indicating these domains (see below).

The relations between worlds are represented as geometrical relations. The picture, in black (next page), has its limitations. Firstly, it depicts worlds primarily as totalities of things, each black ellipse representing a domain of objects, not (to use Wittgenstein's contrast in Wittgenstein 1947, and Lewis's in Lewis 1923) as totalities of what is the case. However the picture can be complicated to indicate "Wittgenstein worlds". Such are the dashed ellipses (or balloons) which show the *range* $r(a)$ of each world a, where $r(a) = \{B : B \; \eta \; a\}$, i.e. the range of a is the class of statements that hold in a.[1] Secondly the separation of the ranges and domains of worlds depicted is seriously misleading. Ranges of different worlds will stand in every elementary class relation, not only disjointness but inclusion (each way) and overlap. Wff A, for example, may hold in both T and in a but not in b or f, while B holds in T and a and f, and C holds in none of them. If worlds are

[1] Totalities are here represented by classes, in accordance with the set-theoretically biased semantical framework adopted. In a different framework totalities would be represented, more accurately, as wholes, as mereological sums of the statements in them, i.e. $\underset{\sim}{r}(a) = \text{sum}\{B : B \; \eta \; a\}$

Worlds picture (in Euclidean 2-space)



restricted to possible worlds, ranges will always overlap, since every classical tautology holds in every possible world (as the rules for holding in possible worlds will show, since they simply reflect truth-table rules). Moreover domains of worlds will usually contain common elements (contrary to the exclusionist picture of Lewis 1973). Pegasus may be an element both of $d(T)$ and of $e(a)$. Indeed, given that the worlds are designed to model features of the one language (and its conceptual apparatus), it is to be expected that

domains of worlds coincide, i.e. $d(a) = d(b)$ for every a and b. For the language has a common store of terms which are about a fixed set of objects. Once however variation of languages over times (dynamic languages) are considered – or alternatively differences between speakers is brought out – the simple and plausible picture of a common domain of objects (*not* of entities) for all worlds, which works nicely for many static formal languages (and many of the systems studied below), may well require complication.

Associated with each world a is its *referential impoverishment*, a world $c(a)$. What holds in $c(a)$ consists of the referential statements (i.e. statements conforming to the canons of the Reference Theory) that hold in a, i.e. the range $r(c(a))$ comprises the referential subset of $r(a)$. Correspondingly the domain of $c(a)$ is $e(a)$.[1] *The* (actual) referential world G, the one and only world according to most empiricists, is defined as $c(T)$. Its range, in terms of which it can be represented, consists of all and only true statements whose truth can be determined referentially, without going beyond G and $e(G)$.[2] By contrast true statements some of whose subject terms occur nonreferentially belong to the much more comprehensive range $r(T)$, which consists of all and only true statements (i.e. everything which is the case). A major thesis of noneism can be restated thus: $r(T)$ properly includes $r(G)$, i.e. not all true statements involve subject terms occurring referentially. The class $r(T) - r(G)$ is the class of true statements whose subject term occurs nonreferentially. As always there are two important, separable but interrelated, classes of cases, intensional statements and inexistential statements. Where A is inexistential one of A's subject terms is about what does not exist; and its semantical assessment makes appeal to elements of $d(T) - d(G)$, i.e. to nonentities. Where A is intensional its assessment involves appeal to worlds other than G or T. For example, where Φ is a simple intensional connective, ΦB holds in T in virtue of the fact that B holds in some other worlds different from T but appropriately related to T. The relation

[1] Or rather that subset of $e(a)$ that is appropriately transparent.

[2] It tends to be taken for granted in the text that $e(G)$ is the world of entities, the liberal empiricist's thing world, and that Carnap's thing statements, e.g. "Scott is heavy", hold in G. But there are other ways of construing G and $e(G)$, e.g. in terms of "stricter" forms of empiricism, such as operationalism or phenomenalism. And there is a certain point in stricter forms such as operationalism; for statements such as "This desk is brown" entail results about what would happen, whereas a really pure empirical basis would only report upon what does happen in certain operations and nothing much more. Thus "is red" in contrast to, e.g., "coincides with mark m" is, so to say, operationally-intensional, and can be analysed semantically in terms of worlds (thing worlds) other than the operational base world OG. In short, the worlds game that is played in the text is played over again (cf. the examples of SMM).

involved is the semantical analogue of the "pointing" feature of intentionality stressed by phenomenologists (bracketing too can be seen as a case of world transfer).

In other words, T, in contrast to G, is not on its own sufficient for the recursive determination of the truth of all the statements in it. In order to determine what holds in T then, it is necessary to examine worlds (represented by sets of statements) beyond T, to look beyond the actual (beyond what exists and beyond what is the case). What the statements of G are about are referents, which can have only referential properties, that is properties whose truth is determined just by reference and accordingly whose truth can be assessed just in G. The subjects of statements true in G cannot have intensional properties, such as being perceived or thought about, and they must all exist. G, like classical logic, consists of extensional statements about existing items. In contrast, the items statements of T are about include many which do not exist, and even those which do exist are not just referents but typically have intensional properties as well as extensional ones. The items of T are much closer to the ordinary concept of a thing than are the referents of G. To deny that $T = G$ is, then, to reject the typical empiricist and extensionalist theses that all truths (worth stating) can be stated in G, that the only "genuine" properties are referential ones which belong to a referent, and the proper concept of an object is that of a referent.

So far no clear separation has been made between the *factual model* (or absolute framework), where what holds in T just is what is in fact true and all other worlds are governed by this requirement, and other models where T is relativised to each given model and gives the set of truths of *that* model. It clarifies matters to look back at the simple one world semantics given for sentential logic S. Among the models (or lines of a truth-table) for S, only one (or some if there are variables to take into account) gave assignments corresponding to the facts. For example, some would bring out "Pegasus exists" as true, others would bring it out as false; all but those that correctly brought it out as false would be excluded as candidates for the factual model; and so for every other elementary statement in the language, leaving (in a language of constant statements) just one range.

For the semantical theories of formal languages while it is most important to consider all models, e.g. in assessing validity, it is quite unnecessary to specify or to make any use of the factual model; for it has no role to play in the determination of such central

semantical notions as validity and satisfiability. On the other hand, for the semantics of natural language, where the important semantical notions are different, and include such absolute (i.e. non-model-relative) notions as truth, reference and meaning, specification of this (or a) factual model is crucial, while determination of the full class of models (of a given type) is of quite limited interest. In the sequel, both sorts of interests will matter. Where it is important to distinguish a factual model, double underlining of its key elements will be used. Thus in particular, $\underline{\underline{T}}$ is the factual (actual) world, the actual world or factual model, and $e(\underline{\underline{T}})$ is *the* domain of entities, i.e. comprises exactly what *does* exist. The preceding discussion of the differences between T and G was, strictly, a discussion of the contrast between $\underline{\underline{T}}$ and $\underline{\underline{G}}$, though the points made apply also to worlds T and G of other models.

A *model*, which is a system of worlds, that is a structure of worlds with certain properties standing in certain relations, can be represented set-theoretically as a relational structure, as an ordered set including all distinctive elements, or all those relevant for the purposes at hand. For example, a model M for neutral quantified S5 modal logic S5Q may consist of the relational structure $M = \langle T, K, D, I\rangle$ where K is a set of possible worlds, the factual world T belongs to K, D is a nonnull domain, the one domain, the same for each world, and I is an interpretation function on initial wffand worlds of K. But M may be varied in a number of ways without altering validity, e.g. T may be removed, or a relation R on worlds (important for analysis of weaker modal logics than S5) added, or D replaced by a function d, or I replaced by η, etc. It is often convenient, especially in application of the semantics for technical purposes, e.g. for decidability arguments, in recovering matrices from the semantics, to isolate from within a model a *model structure*, that part of the model without the interpretation function or holding relation. Then an interpretation I is defined on a model structure, the interpretation characteristically being specified only for initial wff, and then being *extended* by inductive rules to all wff. Most of these points will now be illustrated in semantics for quantified modal logics.

8. *Worlds semantics: quantified modal logics as working examples*. Rather than the system S5Q, which correctly captures (so it is argued in EI) the logic of logical modalities such as logical necessity and logical possibility in combination with distributive neutral quantifiers, *the system* S2 that Lewis favoured, with an orthodox quantificational structure (a neutral version of that of Barcan 1946), *will be taken as basic*, and semantics for

other systems, such as S5Q, derived therefrom. The reasons include these: firstly, not all modalities are logical, and S2 illustrates well how other modalities may be semantically accounted for (e.g. all those of von Wright 1951); secondly as a system, not for logical modality, but for entailment, which was what Lewis sought, S2Q is considerably superior to S5Q; thirdly, the neater semantics for S5Q, with only normal worlds and no interworld relation, do not illustrate nearly as well as those for S2Q the scope for enlargement of the semantical method to multiply intensional functors (such as, e.g., those of belief); and, fourthly, from the semantics for S2Q various semantics for S5Q are readily obtained, but the converse is not the case.

It is advantageous for later developments – with other one-place intensional functors and with entailment and implication correctives – to consider two different formulations of S2Q, a modal formulation S2QB (after Barcan's S2) and a strict implicational formulation S2QI.

The formation rules for these systems simply add to rules for Q, formulated without function parameters, rules – one each – for the intensional connectives $\Diamond$ (logical possibility) and $\prec$ (strict implication) respectively, namely the rules: Where A, B are wffthen so are $\Diamond A$ and $(A \prec B)$. For comparison the respective primitive improper symbols and defined symbols of the systems are as follows:

	S2QB	S2QI
Primitives:	$\sim \ \& \ \Diamond \ U$	$\sim \ \& \prec \ U$
Definitions:	$A \prec B =_{\mathrm{Df}} \sim\Diamond(A \ \& \sim B)$	$\Box A =_{\mathrm{Df}} \sim A \prec A$
	$\Box A =_{\mathrm{Df}} \sim\Diamond\sim A$	$\Diamond A =_{\mathrm{Df}} \sim\Box\sim A$

Definitions common to both systems :

$A \vee B =_{\mathrm{Df}} \sim(\sim A \ \& \sim B)$; $A \supset B =_{\mathrm{Df}} \sim A \vee B$; $A \equiv B =_{\mathrm{Df}} (A \supset B) \ \& \ (B \supset A)$;
$A \mathrel{\&\!\!\prec} B =_{\mathrm{Df}} (A \prec B) \ \& \ (B \prec A)$; $(x)A =_{\mathrm{Df}} (Ux)A$; $(Px)A =_{\mathrm{Df}} \sim(x)\sim A$.

Postulates of S2QB

1. *Sentential schemes* (after Lewis; cf. Feys 1965): $A \ \& \ B \prec A$, $A \ \& \ B \prec B \ \& \ A$, $(A \ \& \ B) \ \& \ C \prec A \ \& \ (B \ \& \ C)$, $A \prec A \ \& \ A$, $(A \prec B) \ \& \ (B \prec C) \prec$. $A \prec C$, $A \prec \Diamond A$, $\Diamond(A \ \& \ B) \prec \Diamond A$.[1]

[1] Bracketing conventions are standard; see e.g. RLR. Deleting the last two schemes gives the axioms of S1°. Then the addition of $A \prec \Diamond A$ yields S1 (or, added to S2°, S2), while $\Diamond(A \ \& \ B) \prec \Diamond A$ yields S2° (or, added to S1, S2).

2. *Quantificational schemes* (after Barcan): $(x)A \dashv A(t/x)$, $(x)(A \dashv B) \dashv . (x)A \dashv (x)B$, $A \dashv (x)A$, where x is not free in A, $\Diamond(Px)A \dashv (Px)\Diamond A$.

3. *Detachment rules*: $A, A \dashv B \rightarrow B$; $A, B \rightarrow A \,\&\, B$; $A \dashv\vdash B, D(A) \rightarrow D(B)$; $A \rightarrow (x)A$.

Postulates of S2QI

1. *Sentential schemes*: $A \dashv A$, $(A \dashv B) \,\&\, (B \dashv C) \dashv . A \dashv C$, $A \,\&\, B \dashv A$, $A \,\&\, B \dashv B$, $(A \dashv B) \,\&\, (A \dashv C) \dashv . A \dashv B \,\&\, C$, $A \,\&\, (B \vee C) \dashv (A \,\&\, B) \vee C$, $\sim\sim A \dashv A$, $A \dashv \sim B \dashv . B \dashv \sim A$, $A \rightarrow \sim A \dashv . \sim A$, $A \,\&\, B \dashv C \dashv . A \,\&\, \sim C \dashv \sim B$.

2. *Quantificational schemes*: $(x)A \dashv A(t/x)$, $(x)(A \dashv B) \dashv . A \dashv (x)B$, with x not free in A, $(x)(A \vee B) \dashv . A \vee (x)B$, with x not free in A.

3. *Detachment rules*: $A, A \dashv B \rightarrow B$; $A, B \rightarrow A \,\&\, B$; $A \dashv B, C \dashv D \rightarrow B \dashv C \dashv . A \dashv D$; $A \rightarrow (x)A$.

The sentential schemes of S2QI – which are those of relevant system DK of UL, together with Antilogism, $A \,\&\, B \dashv C \dashv . A \,\&\, \sim C \dashv \sim B$ – contain redundancies, such as the distribution principle $A \,\&\, (B \vee C) \dashv . (A \,\&\, B) \vee C$, and could with minor adjustment be further reduced.

Equivalence Theorem. S2QB *and* S2QI *are equivalent systems: i.e. if A is a theorem of* S2QB *then its definitional translation (into* S2QI*) is a theorem of* S2QI*, and conversely if A is a theorem of* S2QI *then its translation is a theorem of* S2QB. (Proof is as in Routley 1979b.)

In view of the equivalence theorem the semantics for both systems can be developed at once, under the head of S2Q: only the interpretation rules for $\Diamond$ and $\dashv$ differ.

An S2Q *model structure* (m.s.) M is a structure $M = \langle T, K, N, R, D\rangle$, where K is a set of possible worlds, N, consisting of the modally normal worlds, is a subset of K, T, the factual world, is a member of N, R is a reflexive (accessibility) relation on K, and D is a non-null domain of items or objects. A modally normal world will turn out to be one where some recessitated wff, i.e. wffof the form $\Box C$, holds. It will follow, in virtue of the paradoxical character of S2Q (i.e. because $A \,\&\, C \dashv B, \Box C \rightarrow . A \dashv B$) that every theorem of S2Q holds in modally normal worlds, i.e. such worlds are theorem

regular, whereas in nonnormal worlds theorems may fail to hold, indeed all necessitated theorems will fail. Nonnormal worlds are a step – a very short and halting step – in the direction of incomplete and inconsistent worlds.

An S2Q *model* adds to an S2Q (m.s.) an interpretation or valuation function I (i.e. the model is a structure $\langle T, K, N, R, D, I\rangle$) which supplies assignments as follows: each subject term t is assigned an element $I(t)$ of D; each n-place predicate parameter f is assigned, at each world a of K, an n-place (perhaps extensional) relation on K, i.e. extensionally a subset of K^n; and each sentential parameter is assigned, at each $a \in K$, just one of the truth-values in $\mathrm{II} = \{1, 0\}$. Valuation I is then extended to all wffof S2Q as follows, for every $a \in K$: where f is an n-place predicate and $t_1, \ldots, t_n$ are n subject terms.

$$I(f(t_1, \ldots, t_n), a) = 1 \quad \text{iff } \langle I(t_1), \ldots, I(t_n)\rangle \in I(f, a);^{1}$$
$$I(A \,\&\, B, a) = 1 \quad \text{iff } I(A, a) = 1 = I(B, a);$$
$$I(\sim A, a) = 1 \quad \text{iff } I(A, a) \neq 1;$$

[for S2QB] $I(\Diamond B, a) = 1$ ifffor some c in K such that Rac, $I(B, c) = 1$, or else $a \notin N$, i.e. $\Diamond B$ holds at a iffeither, for some world affecting (possibility assignments in) a, B holds at a, or a is not modally normal, i.e. no necessitated wffholds in a so every possibilitated wff(wffof the form $\Diamond D$) holds in a.

[for S2QI] $I(A \dashv\!\!\!\supset B, a) = 1$ iff $a \in N$ and for every b in K such that Rab and $I(A, b) = 1$ then $I(B, b) = 1$, i.e. $A \dashv\!\!\!\supset B$ holds at a iff a is normal (i.e. does not exclude wffof the form $A \dashv\!\!\!\supset B$, i.e. $\Box(A \supset B)$) and no world b affecting a provides a counterexample to $A \dashv\!\!\!\supset B$, i.e. a situation such that A holds at b but B does not.

$I((x)A, a) = 1$ iff $I'(A, a) = 1$ for every x-variant I' of I, where I' is an x-variant of I iff I' differs from I at most in assignments to x, i.e. roughly, $(x)A(x)$ holds at a iff $A(x)$ holds at a for every value of x.

Main semantical notions used in the investigation of S2Q can now be defined. These notions may be similarly defined for any first-order intensional logic. A wff A is *true in* M just in case $I(A, T) = 1$, and *false in* M otherwise. A is S2Q-*valid* iff A is true in all S2Q-models, and *invalid* otherwise. A set S of wffis S2Q *simultaneously satisfiable* ifffor some S2Q-model M, every wff A in S is true in M.

[1] The rule can be alternatively stated in attribute theory, using ι (instantiation) in place of $\in$. There is, that is, nothing uneliminably set-theoretical about the semantics.

Along with these objectual semantics, a truth-valued (or enlarged substitutional) semantics[1] is given, partly because it can be supplied at no extra cost, and partly in preparation for the semantical treatment of second-order logics (in §18). Truth-valued semantics for S2Q, which in effect always select D as the domain of terms of S2Q and so can delete D, are even simpler. An S2Q *TV m.s.* is simply an S2 m.s., i.e. a structure $\langle T, K, N, R\rangle$. A *TV valuation* in such an m.s. is a function which assigns to each atomic wffat each a of K an element of II. The extension of I for wffcompounded by connectives is as before, but the extension to quantified wffbecomes:

> $I((x)A, a) = 1$ iff $I(A(t), a) = 1$ for every term t. TV truth, validity, and so on, are defined, in terms of TV valuations, as above for truth, etc.

Proving the adequacy of the semantics given for S2Q, i.e. that theoremhood and validity coincide, takes some trouble, at least the completeness proof does. While the soundness proof will be sketched, only the canonical modelling for the completeness argument and notions required for stating and outlining the strong completeness result are furnished (further details, including proofs of lemmas appealed to, may again be found in Routley 1979b).

Soundness Theorem. *Every theorem of* S2Q *is* S2Q*-valid, and also* S2Q*-TV-valid.*

Proof is straightforward case by case verification, showing that the axioms are valid and that the rules preserve validity. Some strategic examples illustrate the details in the case of S2QI.

ad instantiation. Suppose $I((x)A(x) \multimap A(t/x), T) \neq 1$ for some S2Q model. Then for some a such that RTa, $I((x)A(x), a) = 1 \neq I(A(t/x), a)$. Hence $I^x(A(x), a) = 1$ for every x-variant I^x of I, and so $I^t(A(x), a) = 1$, contradicting $I(A(t/x), a) \neq 1$.

ad distribution. Suppose, on the contrary, that for some a such that RTa, $I((x)(A \multimap B(x)), a) = 1$ but $I(A \multimap (x)B(x), a) \neq 1$, where x is not free in A. Then for some b such that Rab, $I(A, b) = 1$ and $I^x(B(x), b) \neq 1$ for some x-variant I^x of I. But $I^x(A \multimap B(x), a) = 1$ always; so whenever Rab and $I^x(A, b) = 1$, that is, $I(A, b) = 1$, as x is not free in A, $I^x(B(x), b) = 1$, contradicting $I^x(B(x), b) \neq 1$. Details of the semantical verification reveal why this principle is a watershed one between rigid semantics, with

[1] For a survey of such semantics, see Leblanc 1976.

a single domain D of objects the same for each world, and alternative variable-domain semantics.

ad affixing. Suppose, for some model M, $I(B \dashv C \dashv . \ A \dashv D, T) \neq 1$. Then for some a such that TRa, $I(B \dashv C, a) = 1 \neq I(A \dashv D, a)$, and so $a \in N$. Hence for some b, Rab, $I(A, b) = 1$ and $I(D, b) \neq 1$, and so also either $I(B, b) \neq 1$ or $I(C, b) = 1$. Now consider a new model M' which differs from M just in taking world a as base in place of T: this is permissible since $a \in N$. There are two cases to examine according as $I(B, b) \neq 1$ or $I(C, b) = 1$. Suppose $I(B, b) \neq 1$. Then as $I(A, b) = 1$, Rab and $a \in N$, $I(A \dashv B, a) \neq 1$, contradicting the validity of $A \dashv B$. So $I(C, b) = 1$. But then as $I(D, b) \neq 1$, $I(C \dashv D, a) \neq 1$, contradicting the validity of $C \dashv D$.

Completeness is most readily established through design of linguistically-characterised canonical models which reject given nontheorems, or sets of nontheorems (the methods are explained in detail in RLR, chapter 3). Canonical S2Q-models are characterised in terms of a class of straight S2Q-theories, a theory being represented as a class of wff satisfying specified conditions. Since the same notions feature in completeness proofs for a range of quantified implication systems LQ (e.g. for entailment systems), the preliminaries are stated more generally than required simply for S2Q. The definitions are intended to apply both to LQ and to linguistic extensions of LQ – also designated by LQ – obtained by adding further (at most denumerably many more) subject variables or constants to LQ (and accordingly inflating the supply of wffand logical axioms).

An LQ-*theory* d is any set of wffof LQ which is closed under adjunction and provable LQ-implication, i.e. for any wff A, B, if $A \in d$ and $B \in d$ then $A \ \& \ B \in d$, and if $A \in d$ and $\vdash_{\mathrm{LQ}} A \dashv B$ then $B \in d$. An LQ-theory d is *regular* iffall theorems of LQ are in d; *prime* ($\vee$-complete) iffwhenever $A \vee B \in d$ either $A \in d$ or $B \in d$; *rich* (U-complete) iff, whenever $A(t/x) \in d$ for every subject term t of LQ, $(x)A \in d$; *saturated* (P-complete) iff, whenever $(Px)A \in d$, $A(t/x) \in d$ for some term t of LQ. An LQ-theory is *quantifier-complete* iffboth rich and saturated; *straight* iffprime and quantifier-complete; and *adequate* iffstraight and regular. A theory is *nondegenerate* (n.d.) iffneither null nor universal (i.e. contains every wff). For systems with a classical negation, such as S2Q, the canonical model is built out of n.d. straight theories.

Let $\bar{K}_{\mathrm{LQ}}$ be the class of LQ-theories, and K_{LQ} the class of n.d. straight theories. For $a, b \in \bar{K}_{\mathrm{LQ}}$, $a \in \bar{N}_{\mathrm{LQ}}$ iff a contains some wffof the form $B \dashv C$; $\bar{R}_{\mathrm{LQ}}ab$ iffwhenever

$p \vee \bar{p} \dashv A \in a$, $A \in b$, i.e., in the case of all the systems to be considered, iffwhenever $\Box A \in a$, $A \in b$ for every wff A; $\bar{O}_{\mathrm{LQ}}a$ iff a is regular. $\bar{T}_{\mathrm{LQ}}$ is the set of theorems of LQ, i.e. $\bar{T}_{\mathrm{LQ}} = \mathrm{LQ}$. The unbarred relations R_{LQ}, N_{LQ} and O_{LQ} are the restrictions to n.d. straight LQ-theories of the barred relations, e.g. R_{LQ} is the restriction of $\bar{R}_{\mathrm{LQ}}$. Since for the modal systems LQ to be studied in this book $\vdash_{\mathrm{LQ}} B \dashv C \dashv . A \dashv A$, and so $\vdash_{\mathrm{LQ}} B \dashv C \dashv . Th$, for every theorem Th, it follows that $a \in \bar{N}_{\mathrm{LQ}}$ iff $\bar{O}_{\mathrm{LQ}}a$ for every $a \in \bar{K}_{\mathrm{LQ}}$. Thus $\bar{T}_{\mathrm{LQ}} \in \bar{N}_{\mathrm{LQ}}$.

Where T_{LQ} is any adequate LQ-theory, the *canonical model* LQ m.s. *on* T_{LQ} is the structure $M_C = \langle T_{\mathrm{LQ}}, K_{\mathrm{LQ}}, N_{\mathrm{LQ}}, R_{\mathrm{LQ}}, D_{\mathrm{LQ}} \rangle$, where D_{LQ} is the class of terms of LQ. D_{LQ} is denumerable. That completes details of the canonical model. To state the strong completeness theorem for S2Q one further definition is needed. Where S and T are sets of wffof LQ, T is LQ-*derivable from* S, written $S \vdash_{\mathrm{LQ}} T$, i ff for some $A_1, \ldots, A_m$ in S and $B_1, \ldots, B_n$ in T, $\vdash_{\mathrm{LQ}} A_1 \,\&\, \ldots \,\&\, A_m \rightarrow . B_1 \vee \ldots \vee B_n$. A basic case is where A is a nontheorem of S2Q; then A is not S2Q-derivable from the theory S2Q.

Strong Completeness Theorem for S2Q. *Where U is a non-null set which is not* S2Q*-derivable from set S which contains an implicational wff, there is a [canonical] denumerable* S2Q*-model under which every member of S is true and every member of U false.*

Proof. By a lemma there is an adequate S2Q′-theory T_{S2Q}, which includes S but excludes U. Form the canonical S2Q′ m.s. M_C which includes S but excludes U. Form the canonical S2Q′ m.s. M_C on $T_{\mathrm{S2Q}'}$. It is denumerable. Define a canonical interpretation I in M_C as follows:

$I(p, a) = 1$ iff $p \in a$, for every sentential parameter p;

$I(t, a) = t$, for every subject term t of S2Q′;

$I(f, a) = \hat{t}_1 \ldots \hat{t}_n(f(t_1, \ldots, t_n) \in a)$ for every n-place predicate parameter f, or alternatively $I(f, a) = \lambda t_1 \ldots t_n(f(t_1, \ldots, t_n) \in a)$ for every f.

Since each term belongs to $D_{\mathrm{S2Q}'}$, I is an interpretation in M_C.

It suffices to show

(α) $I(D, a) = 1$ iff $D \in a$, for every $a \in K_{\mathrm{S2Q}'}$ and every wff D of S2Q′, and

(β) M_C is an S2Q m.s. with base $T_{\mathrm{S2Q}'}$.

For then the theorem follows. Firstly, for $A \in S$, $A \in T_{\mathrm{S2Q}'}$ and so, by (α), $I(A, T_{\mathrm{S2Q}'}) = 1$, i.e. A is true in the canonical model. Secondly, for $B \in U$, $B \neq T_{\mathrm{S2Q}'}$, and so by (α) $I(B, T_{\mathrm{S2Q}'}) = 0$, i.e. the canonical model falsifies B.

ad (β). It remains only to show $R_{\mathrm{S2Q}'}$ is reflexive.

Suppose then for $a \in K_{\mathrm{S2Q}'}$, $\Box A \in a$. Then, as $\vdash_{\mathrm{S2Q}'} \Box A \supset A$, $A \in a$ by closure properties. (Note that $\Box A \supset A$ is implicationally equivalent to the reductio principle $A \supset \bar{A} \supset . \ \bar{A}$.)

ad (α). Proof is by induction. Since

$$\begin{aligned} I(f(t_1, \ldots, t_n), a) = 1 \text{ iff } & \langle I(t_1), \ldots, I(t_n) \rangle \in I(f, a) \\ \text{iff } & t_1, \ldots, t_n \in \hat{t}_1 \ldots \hat{t}_n (f(t_1, \ldots, t_n) \in a) \\ \text{iff } & f(t_1, \ldots, t_n) \in a, \end{aligned}$$

the induction basis is established. The induction step for connective & is straightforward (and as in RLR).

ad $\sim$. The result is straightforward once it is shown that $\sim A \in a$ iff $A \notin a$. Suppose firstly $\sim A \in a$ and $A \in a$. Then $\sim A \ \& \ A \in a$.
But $\vdash \sim A \ \& \ A \rightarrow B$, so $B \in a$ for arbitrary B contradicting the non-degeneracy of a. Suppose, for the converse, $A \notin a$ and $\sim A \notin a$. Since a is non-null, some wff $D \in a$. Hence as $\vdash D \rightarrow . \ A \vee \sim A$, $A \vee \sim A \in a$, whence as a is prime $A \in a$ or $\sim A \in a$, which is impossible on the hypotheses.

ad $\supset$. D is of the form $(B \supset C)$. If $B \supset C \in a$ then $I(B \supset C, a) = 1$ in virtue of the definition of $R_{\mathrm{S2Q}'}$ and the induction hypothesis. For the converse suppose $B \supset C \notin a$. By a lemma (which requires much work) there is a b in $K_{\mathrm{S2Q}'}$ such that $B \in b$, $C \notin b$ and for every wff A if $\Box A \in a$ then $A \in b$. Thus $R_{\mathrm{S2Q}'} ab$ holds. So applying the induction hypothesis, $R_{\mathrm{S2Q}'} ab$ and $I(B, b) = 1$ and $I(C, b) \neq 1$, that is $I(B \supset C, a) \neq 1$, as required.

ad U. For every $a \in K_{\mathrm{S2Q}'}$,

$$\begin{aligned} I((Ux)A, a) = 1 \quad & \text{iff} \quad I^x(A, a) = 1 \text{ for every } x\text{-variant } I^x \text{ of } I \\ & \text{iff} \quad I(A(t/x), a) = 1 \text{ for every } I(t) \in D_{\mathrm{S2Q}'} \\ & \text{iff} \quad A(t/x) \in a \text{ for every term } t \text{ of S2Q}', \text{ by applying the induction} \\ & \qquad \text{hypothesis and the equation } I(t) = t, \\ & \text{iff} \quad (Ux)A \in a, \text{ since } a \text{ is rich and closed under S2Q}' \text{ implication.} \end{aligned}$$

For the truth-valued semantics the matter is still simpler. For $a \in K_{\text{S2Q}'}$,

$$\begin{aligned} I((x)A, a) = 1 \quad &\text{iff} \quad I(A(t/x, a) = 1 \text{ for every subject term } t; \\ &\text{iff} \quad A(t/x) \in a \text{ for every } t, \\ &\text{iff} \quad (x)A \in a. \end{aligned}$$

For if $A(t/x) \in a$ for every t then, by richness, $(x)A \in a$; and the converse follows by instantiation and S2Q$'$-closure.

Corollaries

1 (*Completeness*). *Every valid wffof* S2Q *is a theorem.*

2 (*TV Completeness*). *Every TV valid wffof* S2Q *is a theorem of* S2Q.

3 *Every* S2Q*-theory is simultaneously satisfiable in a denumerable model, and thus has a model.*

4 (*Skolem–Lowenheim*). *Every simultaneously satisfiable class of wffis simultaneously satisfiable in a denumerable model.*

5 (*Compactness*). *If S is a set of wffof* S2Q *such that every finite subset of S has an* S2Q*-model then S has an* S2Q*-model.*

Proof.

1. Suppose A is a non-theorem of Q. Set $U = \{A\}$ and $S =$ S2Q and apply the theorem.

3. Let S be an S2Q-theory and let $U = \{D\}$ where D is a wff, guaranteed by non-degeneracy, not in S, and hence not S2Q-derivable from S. Thus by the strong completeness theorem, S is simultaneously satisfiable in a denumerable model.

4. Apply 3.

5. Suppose S is a set of wffsuch that every finite subset of S has a model. Then every finite subset of S is consistent and hence absolutely consistent. Hence S is absolutely consistent, since a given arbitrary wffis only S2Q-derivable from S only if it is derivable from a finite subset of S; that is, some wff D is not derivable from S. But then by a lemma there is an S2Q-theory S' including S but not containing D. Hence by 3, S' and so S has an S2Q-model.

Now simple variations on the arguments will supply constant domain semantics with nice corollaries for many other quantified modal logics, e.g. semantics for S3Q result

upon requiring that relation R be transitive; for TQ that $N = K$ i.e. all worlds are normal; for S4Q that R be transitive and $N = K$; for S5Q in addition to S4Q requirements that R be symmetrical (whence R is an equivalence relation and can indeed be eliminated from the modelling, as in Carnap's and Kripke's semantics for orthodox S5Q).

Modal logics leave us with a serious dilemma owing to their conflation of modality and implication. For while the implicational theory forces us (or should force us, if our sensibility to implicational principles has not been entirely warped) towards systems S2 or S3, the modal theory forces us towards S4 or S5. (The reasons are presented in RLR, chapter 1). Since our present interest is primarily modality, we shall now swing in the S5 direction (especially since it is argued in EI, p. 140ff. and RLR that S5 is the correct system for logical modalities, i.e. where $\Box$ reads "it is logically necessary that" and $\Diamond$ "it is logically possible that"). The following axiom which guarantees an S5 modal structure is accordingly grafted onto S2Q, yielding system S5Q for which semantics have already been indicated, namely $\Diamond A \supset \Box\Diamond A$. As to how this scheme yields S3 and S4 postulates, see Feys 1965, p. 115.

Adoption of S5Q opens the way to certain objections, often reckoned to be very telling, that have been directed against logics including an S5 modal structure (and sometimes, erroneously, against any modal logic). In particular it has been objected, first, that an S5 structure guarantees the derivability of the very dubious Barcan wff, namely $\Diamond(\exists x)A \supset (\exists x)\Diamond A$ and $(x)\Box A \supset \Box(x)A$ (Barcan formulae) and their converses $(\exists x)\Diamond A \supset \Diamond(\exists x)A$ and $\Box(x)A \supset (x)\Box A$ (Barcan converses), and that any weaker modal structure requires these formulae for logical reasons; second, that a quantified modal logic with identity leads inevitably to the formulae $\Box(x = y) \equiv .\ x = y$ and thence to modal paradoxes; and, thirdly, that any normal modal logic excludes, by its rule of necessitation, contingent assumptions, such as that something exists, from the logic.

None of these objections work against the logic presented. Firstly, the Barcan formulae are not theorems, indeed are not even wffuntil an existence predicate is introduced (as in the next subsection), only the quite unobjectionable neutral analogues of Barcan wffare theorems. The standard objections to Barcan wff(both formulae and their converses) depend on existential construal of the quantifiers and fail when the quantifiers are construed neutrally (see Slog, p. 546). Secondly, as already explained (§11, p. 131), when identity is properly introduced, the modal paradox arguments fail, and the "validity" of

the wff $\Box(x = y) \equiv .\ x = y$ depends upon confusing strict and extensional identity. Thirdly, the assertion of contingent truths in the logics is not excluded; for necessitation is not a rule of the logic, but only a derived rule which does not hold for extensions of the logic by merely contingent postulates. That is, contingent truths can be consistently added to the logic, without being necessitated.[1]

9. *Reworking the extensions of quantificational logic in the modal framework*. Just as quantificational logic was enriched by many adjuncts, existence and possibility predicates, predicate negation, choice descriptors, so, in the quest for an adequate logic . . . each of the successors of quantificational theory can be enriched, beginning with quantified modal logics. But we can be brief about some of these enrichments, since in some cases the matters have been treated elsewhere and in other cases the same issues will arise again at the next stage (§18 or following). The order of treatment is roughly that of increasing problematicness.

a. *Existence and Barcan wff*. As in Q, so in LQ an existence predicate E can be introduced, or some predicate constant assigned to fulfil its role. As before LQ is some quantified intensional or modal logic (usually with a constant, i.e. world-invariant, domain of objects). In the basic system, LQ with E, E satisfies no further conditions. Even in such a system a good deal can be accomplished, as development of the system S5R* of EI reveals (p. 114ff.) In particular, it can be straightforwardly demonstrated that the Barcan wffand their converses fail, and should fail (EI, p. 117); and convincing restrictions on the truth of Barcan wffcan be deduced from the theory.

A somewhat more interesting system with existence S5QE has these axioms on existence:

E1. $(Px)xE$

E2. $(Px)\Box{\sim}xE$

E3. ${\sim}\Box(Px)xE$

E1 is true because something does in fact exist; E2 is true because some things, impossibilia, necessarily do not exist; while E3 is true because, more controversially, noth-

[1] An example drawn from the next subsection, from system LQE, is the contingent truth $(Px)xE$. And in fact were $\Box(Px)xE$ to follow, by necessitation, the inconsistency of LQE would result by Meinong's theorem according to which nothing necessarily exists.

ing exists of logical necessity. It follows, incidentally, since it is provably false that $\Box(\forall x)xE \supset (\forall x)\Box xE$ (and similarly for its strict analogue), that the converse Barcan formulae are demonstrably false.

A semantics for S5QE is already given in Slog (p. 549ff.); it suffices to sketch the details. Even when the objects of different worlds are appropriately invariant, what exists will vary from world to world. Thus to domain 1) is added a function, e (giving existents at each world), subject to the following modelling requirements: $e(T)$ is nonnull, for some a such that TRa, $e(a)$ is null, and for every b such that TRb, $D - e(b)$ is nonnull. The evaluation rule for E is as follows:

$I(tE, c) = 1$ iff $I(t) \in e(c)$.

Adequacy of the semantics is established as in Slog, (p. 550), which also studies significance elaborations of quantified modal logics with existence, and in particular systems which enable the proper distinction of inconsistent subjects from absurd subjects, such as "the wheels of happiness" and "Meinong's round idea".

b. *Possibility and other properties*. What has been done with existence can be replicated or varied for other ontic properties, for instance for possibility.

c. *Predicate negation and internal negation*. The logical theory of predicate negation 1.17(4) is straightforwardly extended to intensional settings. In modal logics like S5Q the axiom is $\Box DN^n$, i.e. the necessitation of DN^n, in entailment logics the axiom is $\underset{\sim}{t}\sim\sim h \Leftrightarrow \underset{\sim}{t}h$. The semantics is as before except that T is replaced by world variable a, e.g. $I(\underset{\sim}{t}\sim h, a) = 1$ or $= 0$ according as the model assigns, subject to the restriction that $\underset{\sim}{T}(\underset{\sim}{t}\sim\sim h, a) = I(\underset{\sim}{t}h, a)$.

The semantics for internal negation is obtained by adding to models an operation $\dagger$ on K which is involutory, i.e. $a^{\dagger\dagger} = a$ for a in K. The rule for evaluating internal negation $^-$ is simply $I(\bar{A}, a) = 1$ iff $I(A, a^\dagger) \neq 1$, for every a in K and every wff A. The role of internal negation is further considered in §23.

d. *Extensional identity*. Within the framework of quantified modal logic an interesting, if rudimentary, theory of extensional identity can be obtained, and the discussion of §11 (especially p. 132 ff.) formally elaborated. A formal theory of extensional identity may

be obtained in the following way (there are several equivalent approaches): To any of the quantified modal logics considered is added (or singled out) a two-place predicate constant $=$, read "is (extensionally) identical with" or "is identical with (under the extensional determinate)", and subject to the expected formation rule: where u and v are subject terms $(u = v)$ is a wff(cf. 1.17(6)). The basic postulates are (on a standard S5Q formulation):[1]

$=$1. $u = v$

$=$2. $u = v \supset .\ A(u) \supset A(v)$, where u and v are subject terms and $A(v)$ results from $A(u)$ by replacing an occurrence of u by v, this occurrence being neither within the scope of quantifiers (or descriptors) binding variables in u or v nor modalised, i.e. within the scope of a (primitive) modal connective such as $\Diamond$, $\Box$, $\dashv\exists$ (*proviso III*).

It follows, among other things (see EI, p. 121) that $=$ is a reflexive, symmetric and transitive relation, i.e. is an equivalence relation, satisfying qualified substitutivity conditions.

Strict identity is defined: $x \equiv y =_{\mathrm{Df}} \Box(x = y)$. It can be shown that strict identity is characterised by the following schemes:

$\equiv$1. $u \equiv u$

$\equiv$2. $u \equiv v \supset .\ A(u) \supset A(v)$, subject to *proviso I* (of 1.17(6)),[2]

i.e. the provision differs from proviso III in not excluding replacements in modal contexts. The scheme $\equiv$2 is proved by an inductive argument (see EI, p. 122). Conversely, if $\equiv$ is introduced as a further primitive satisfying $\equiv$1 and $\equiv$2, it is readily proved that $x \equiv y \mathrel{\&\dashv\exists} .\ \Box(x = y)$.

[1] That is, where the formulation includes a rule of necessitation or requisite equivalent. Where it does not, as with the formulation of S5Q presented in 1.17(8), the necessitations of $=$2 and $=$3 are the postulates required, i.e.

$\Box(u = u)$ and
$u = v \dashv\exists .\ A(u) \supset A(v)$, subject to proviso III.

[2] The point of the previous note is again relevant. If necessitation is not given (in effectively primitive form), $\equiv$2 is replaced by $u \equiv v \dashv\exists .\ A(u) \supset A(v)$, with *proviso I*.

It is evident, from a comparison of ≡1 and ≡2 with ≈1 and ≈2 (of 1.17(6)), that strict identity coincides in quantified modal settings with Leibnitz identity. However this feature simply reflects the fact that such modal logics contain no more highly intensional functors. A system which also included, for instance, such epistemic functors as "x knows that" and "t believes that", would make the requisite distinction, Leibnitz identicals but not strict identicals being replaceable in epistemic contexts. (Further schemes resembling ≡2 but for epistemic identity relations are straight-forwardly devised; then too the ways in which schemes for various identity determinates interconnect begin to emerge. How the schemes are unified is considered in §20.)

As important as what holds valid for identity is information as to what fails. Most important, $x = y \supset \Box(x = y)$ fails. It is not that the negation of its closure, namely $\sim(x, y)(x = y \supset \Box(x = y))$, is a theorem – though there are stronger consistent systems containing the latter as a thesis (see EI, p. 123) – but that the principle is rejected, as not valid, i.e. $\dashv x = y \supset \Box(x = y)$. Various means can be used to show that such undesirables are rejected, e.g. tableaux methods (as in EI), but modelling techniques are perhaps the best, and these emerge from that desideratum, semantics for the systems.

Semantical models for system $\mathrm{LQ}^{=}$, i.e. for LQ together with extensional identity, are the same as those for underlying system LQ. All that is new is a rule for evaluating identity wffat worlds, a rule rendering a little more explicit what is already given, namely $I(u = v, a) = 1$ iff $\langle I(u), I(v)\rangle \iota I(=, a)$, so that postulates =1 and =2 can be verified. The rule is this:

$$I(u = v, a) = 1 \text{ iff } I(u) =_a I(v),$$

i.e. $I(u)$ and $I(v)$ are a-identical, where a-identity is coincidence on all properties which are evaluated just at a (i.e. as to extensional features), without going from a, through an interworld relation, to other worlds. The relation a-identity is a generalisation of extensional identity, which is T-identity.[1] Since a T-identity, such as Venus $=_T$ Adonis, does not guarantee an a-identity for every world a assessible from T, e.g. for world b, so that $\sim$(Venus $=_b$ Adonis), in suitable models I(Venus = Adonis $\supset$. $\Box$(Venus =

[1] There are other ways of obtaining a suitable rule for evaluating =. One is presented in EI, pp. 135–36; another is to world-relativize subject assignments and to set $I(u = v, a) = 1$ iff $I(u, a) = I(v, a)$, i.e., in effect, iff u at a is the same as v at a (cf. chapter 2 [reprinted in Vol. 2 *—Eds.*], where the at operation is introduced).

Adonis), $T) \neq 1$, confirming the rejection that led into the semantical theory. To be sure there is a certain circularity about the evaluation rule for $=$, as there is with the rule for U in terms of *every*, and with the derived rule for $\equiv$, $I(a \equiv v, a) = 1$ iff $I(u)$ is the same as $I(v)$, which removes world relativisation. The rules are by no means rendered worthless by such circularity.

Evidently $u = u$ is valid, since $I(u)$ coincides with itself at T on all properties, i.e. $I(u) =_T I(u)$. And $=2$ is valid, ultimately because only the evaluation of excluded modal connectives involves world transfer. Remaining details of proof of the adequacy of the semantics furnished is along the lines set out in Slog (p. 532ff.).

Pretty though the logic and semantics for $=$ are they are not faultless (even for those happy with the notion of extensional identity and with worlds semantics, few enough of course). A serious shortcoming is that, as with the initial identity theory (of 1.17(6)), no formal provisions stop highly intensional functors from entering as primitive predicates open to substitution; so substitutions may result which violate extensional identity requirements. The implicit assumption that all primitive predicates are extensional is hardly satisfactory when it comes to natural language applications of the logic. Nor can it be realistically assumed that every intensional predicate, such as f, can be analysed into a form $\Phi(\ldots\ g)$, where Φ is an intensional sentence connective and g is an extensional predicate, i.e. that all predicate intensionality can be pushed into sentence connectives. Prima facie ordinary predicates such as (... looks for) are not so compounded; and there are deeper reasons for the failure of this popular idea (see Slog, p. 610 and p. 624).[1] Certainly such an assumption breaks down given only the relatively poor resources of quantified modal logics, since more highly intensional predicates cannot be modally resolved. It remains important then to distinguish initial predicates which are extensional from those which are not; in short, in a further theory to introduce predicate ext, as in 1.17(6).[2]

The fuller theory of extensional identity accordingly includes both $=$ and ext. The postulates for $=$ are necessitated versions of those already given, namely

$=1.$ $\quad \Box(u = u)$

[1] Naturally if a predicate resolves into an intensional sentence connective in combination with some predicate, as does "is believed to be given", that is an excellent *indicator* of extensionality of the original predicate.

[2] But for most formal purposes it is thus far, simpler to avoid ext, and to use the split-up method.

$=$2B. $u = v$ & $\mathrm{ext}_i\, f^n$ ⊰ $(\ldots u_{i^{\mathrm{th}}} \ldots) f^n \supset (\ldots v_{i^{\mathrm{th}}} \ldots) f^n$

$=$3. $\Box\,\mathrm{ext}(=)$

and, where E is present,

$=$4. $\Box\,\mathrm{ext}(E)$.

Now, furthermore, $=$2 follows subject to the correct provisions, namely proviso III. For there is no warrant for replacements within modal connectives, reflecting the fact that $\sim\mathrm{ext}(\Box)$. A residual dissatisfaction remains, however, in that it is still not possible to define extensionality for connectives and functors of functors within the systemic framework. By moving to the second-order such problems can be removed.

To extend the semantics for $\mathrm{LQ}^{=}$ to the fuller theory $\mathrm{LQ}^{=\mathrm{ext}}$ with extensionality, a semantical rule for ext_i suffices. The requisite rule, no longer trite in an intensional semantical framework, is:

> $I(\mathrm{ext}_i\, f, a) = 1$ iff, for every given assignment to the other places of f^n than the ith, the evaluation of whether the predicate f^n holds of an item at a (i.e. the evaluation of the ith place) is restricted to a, i.e. does not go beyond a.

This "rule" accords with the account of extensionality adopted, that a predicate is *extensional* if its semantical assessment does not involve world-transfer to worlds other than worlds (of its class) where the evaluation is being made. The account is elaborated in Slog, pp. 610–11 where some of the reasons for adopting it are also explained. For the nontrite rule (as distinct from the trite rule: $I(\mathrm{ext}_i\, f, a) = 1$ iffat a the ith place of f^a is extensional) to succeed, there is a real point in using the intensional (or functional) semantics presented rather than the set-theoretical which make it look as if all primitive products are extensional.

e. *Reduction principles in quantified modal logic.* Just as sentential modal systems such as S2 and S5 are distinguished by sentential principles, the correctness of which (for various interpretations and applications) has to be seriously considered, so there are distinctive (essentially) quantificational principles which distinguish various quantified modal logics in the vicinity of S2Q and S5Q and intermediate systems, the correctness of which needs to be considered. For if such a principle is correct, then a logic which lacks it is incomplete – despite a semantical completeness argument of the sort furnished in the previous subsection.

Principles which can be quickly dismissed are those which directly reduce modalities to quantifiers, viz. a) $(x)A \supset \Box A$ and b) $\Box A \supset (x)A$. These principles are tempting perhaps because of their simplifying effects, because of the way they enable S5Q model postulates to be dispensed with while at the same time delivering welcome principles such as Meinong's theorem. But they do too much. For example b), though it is provable where x is not free in A, is quite unacceptable, as the following example shows: Since impossible items necessarily do not exist, it is true that $(Px)\Box{\sim}xE$. But then it follows by b) that $(Ux){\sim}xE$, i.e. nothing exists![1]

Of particular interest are principles which reduce "problematic" modal expressions. The *problematic* modal expressions of quantified modal logics such as QS5E are expressions of the form: δA, where A is a predicate expression containing free variables and δ is a modal functor. Whereas the modal functors of other – non-problematic – modal expressions of S5QE have a fairly straightforward *de dicto* rendering, the modal functors of problematic modal expressions are sometimes, supposed to represent *de re* modalities (in one sense of this dubious medieval distinction); actually they also have a *de dicto* reading. At any rate there are more difficulties about how problematic expressions such as $\Box xf_o$ are to be construed than there are about non-problematic expressions or about expressions which don't contain modal functors such as xf_o. Thus it is an important question whether problematic modal expressions can be eliminated in favour of at least logically equivalent non-problematic expressions or in favour of sets of such expressions. Since all iterated modalities collapse in S5QE and since all variables can be bound there are only four main problematic modal schemes to consider: these can be typified using the sample predicate f by:

$$(x)\Box xf, \quad (Px)\Diamond xf, \quad (x)\Diamond xf, \quad (Px)\Box xf$$

Now the first two can be eliminated using the provable equivalences

$$(x)\Box xf \dashv\vdash \Box(x)xf \quad \text{and} \quad (Px)\Diamond xf \dashv\vdash \Diamond(Px)xf.$$

Can the last two be eliminated? Both von Wright and the Kneales claim that in the case of *logical* modalities (and classical quantifiers) they can. If they can be eliminated not only is S5QE defective under interpretation because it contains too many distinctions;

[1] Principle b) also leads to the principle of predication which is refuted below.

also, according to von Wright, combination of modalities with quantification loses some of its interest.

The Kneales, who tentatively reach the conclusion "that there is no need to admit the operation of quantifiers across modal signs" (Kneale[2] 1962, p. 618) begin by distinguishing two interpretations of $(\exists x)\Box xf$: neither interpretation is really satisfactory, and the two are not exhaustive (since, e.g., "some or other" differs from "a certain"). Under the first essentialistic, and inadequate, interpretation, as "there is something which under any description is necessarily f", the statement is reckoned to be equivalent to $\Box(\forall x)xf$. The second interpretation of "$(\exists x)\Box xf$", as "there is something which under some description is necessarily f", is more important. Then, the Kneales argue

> ... $(\exists x)xf$ cannot express a true proposition unless there is something which among its permissible descriptions has one entailing the predicate xf. But this is as much as to say that the disputed formula is equivalent to $(\exists x)xf$. Therefore $(\exists x)\Box xf$ cannot on either interpretation represent a new kind of proposition.

The argument is invalid. The Kneales assert what is tantamount to: $(\exists x)\Box xf \dashv\!\models (\exists x)xf$, which is correct. But this is not to say $(\exists x)xf \equiv (\exists x)\Box xf$ as they claim. They do not show how $(\exists x)xf \supset (\exists x)\Box xf$ follows; and it does not. It is not a theorem and not valid under the second intended interpretation. There are critical limitations on the ways an item may be correctly described.

Von Wright bases his elimination proposal on his principle of predication (advanced in von Wright 1951, p. 27), a principle which can be formulated neutrally, when significance conditions are omitted, as,

PP. $\quad (Px)(\Diamond xf \supset \Box xf) \supset (Ux)(\Diamond xf \supset \Box xf)$

or, more revealingly, $(x)(\Box xf \vee \Box{\sim}xf) \vee (x)(\Diamond xf \;\&\; \Diamond{\sim}xf)$. Thus on the strength of this principle von Wright divides attributes into two classes: logical and descriptive. Then separate elimination schemes are suggested for problematic modal expressions according as the property specified is logical or descriptive, e.g. $(Px)\Box xf$ is eliminated using: if f is logical, $(Px)\Box xf \equiv (Px)xf$; if f is descriptive, $(Px)\Box xf \equiv \Lambda(\equiv \Box(Px)fx)$, i.e. is equivalent to the False. Von Wright does not propose (contrary to what Prior suggests; Prior 1962, p. 211) a single unconditional elimination scheme such as is illustrated by the

interchange principle

IP1. $(Px)\Box xf \equiv \Box(Px)xf$

However given a very plausible condition on logical properties IP1 does follow from von Wright's elimination schemes. Even so IP1 does not follow from PP (as construction of an appropriate semantic tableau discloses: for the tableau method see EI). Principle PP does not appear to provide a single elimination scheme. Any scheme it did furnish would be as unsatisfactory as the principle PP on which it is based. Principle PP, as would be expected of such a *some* to *all* implication, is not valid in S5QE; but that may only reflect a defect in the system. PP is also said to be in doubt (von Wright) or falsified by higher-order properties (Prior: see Prior 1962, p. 212). It is certainly falsified by the theory of items (and by *any* satisfactory theory), in the case of the supervenient predicate E, and its negation. For it is true both that $(Px)\Box{\sim}xE$ and $(Px)\nabla T{\sim}xE$, i.e. for some x it is necessary that x does not exist and for some other x it is contingently true that x does not exist. For it follows $(Px)(\Box{\sim}xE \vee \Box xE)$ and $(Px)(\Diamond{\sim}xE \,\&\, \Diamond xE)$, contradicting PP.[1] Recourse to supervenient predicates is not however required; on the theory of items almost any characterising predicate which is sometimes contingently held yields counterexamples to PP. Consider, for instance, "is round"; for some x, e.g. the round square, necessarily x is round, while for some x, e.g. a garden bed, it is contingent x is round. In fact, the PP principle and the proposed elimination schemes are implausible once a purely referential theory of the role and meaning of variables and constants is abandoned. Whether a property belongs necessarily to a subject which has it does not as a rule depend just on the sort of attribute; it also depends commonly on the description or mode of signifying the object, on what the object is. The Kneales drive this point home beautifully (Kneale[2] 1962, p. 616). Von Wright cites as typical logical properties arithmetical properties. But as Kneale say:

> Being less than 13 is an arithmetical attribute, and we may, if we like, say that it belongs necessarily to the number 12; but it is false that the number of apostles is necessarily less than 13, although the number of apostles is undoubtedly 12.

[1] Negate the revealing form of PP and then push the negation down to initial wff: the result is $(Px)(\Box xf \vee \Box{\sim}xf) \,\&\, (Px)(\Diamond xf \,\&\, \Diamond{\sim}xf)$.

As soon as it is admitted that true ascriptions of modal properties to subjects is not merely referential, but depends on the meanings of the subjects, on their interpretation in worlds other than G, that classification of properties as logical or descriptive which rests on the principle of predication breaks down. Thus the dichotomy essential for von Wright's replacement of problematic modal expressions is destroyed. Furthermore even when f is an example of what von Wright would class as a descriptive property, e.g. a simple colour property, $(Px)\Box xf$ is not automatically false. The same mistaken assumptions are made in the principle of predication as are made in some of Quine's arguments concerning quantifying into modal frames (see 1.11).

The interchange principles, IP1 and its mate

IP2. $\quad (x)\Diamond xf \equiv \Diamond(x)xf$

which would enable the elimination of problematic modal expressions, are considerably more difficult to assess. It suffices of course to confirm or falsify one of the principles, since $(x)\Diamond A \equiv \Diamond(x)A$ and $(Px)\Box A \equiv \Box(Px)A$ are interderivable. Neither principle is valid in S5QE. More generally, neither is valid in any system which interprets quantifiers in the usual extended truth-function way, e.g. the universal quantifier as like a conjunction or as an infinite conjunction. For instance, a two object model would reduce IP2 to the form $\Diamond p_1 \;\&\; \Diamond p_2 \equiv \Diamond(p_1 \;\&\; p_2)$, which is false (take p_1 as contingent and p_2 as $\sim p_1$). But such an appeal is not decisive; in particular, it does not show that IP1 and IP2 are not true for other quantifier determinates, which perhaps correspond better to natural language quantifiers. Prior does argue independently however, that the interchange principles are false (Prior 1962, pp. 212–23). Prior argues that $(x)\Diamond A$ is sometimes true but $\Diamond(x)A$ is always false in the case where A is the wff $xf \;\&\; (Px)\sim xf$. It is indeed provable, e.g. in S2Q, that $\sim\Diamond(x)(xf \;\&\; (Px)\sim xf)$,[1] so $\Diamond(x)A$ is certainly false. But "the assertion $(x)\Diamond A$, with everything it is possible that the thing should f when there is something that does not f, is for many f's, perfectly true" (p. 213). Whether this is ever true depends crucially on the terms involved, what is admitted under "everything". In particular, to come directly to the point, *if* ξ terms are admitted in the expected fashion, Prior is simply

[1] In outline a proof runs as follows: $(Px)\sim xf \vee \sim(Px)\sim xf$, by LEM; $(Px)\sim xf \vee (Px)\sim(Px)\sim xf$; $(Px)(\sim xf \vee \sim(Px)\sim xf)$, $\sim(x)(xf \;\&\; (Px)\sim xf)$. But each line can be covered by $\Box$, since $\Box(B \vee \sim B)$ and $C \dashv D \rightarrow \Box C \dashv \Box D$; and $\Box\sim D \equiv \sim\Diamond D$.

wrong. For as $(\xi x{\sim}xf)f \dashv (x)xf$,[1] $(Px)(xf \dashv {\sim}(Px){\sim}xf)$ by particularisation, whence ${\sim}(x)\Diamond(xf \;\&\; (Px){\sim}xf)$ for every f. The question of the correctness of interchange principles thus leads to the vexed issue of descriptors in quantified intensional logics.

f. *Choice operators and descriptors*. Somewhat as the quantifiers U and P of Q can be extended in more than one way to model enlargements of Q (e.g. as conforming to interchange principles or not), so choice operators and other descriptors can be combined in different, perhaps competing, ways with modality. The obvious, and a correct, way to introduce descriptor ξ into modal logics such as S2 and S2Q is (so it is argued in Slog, p. 560ff. and in PLO) to have it conform to the scheme

$$\Box A\xi. \qquad A(t) \dashv A(\xi x A).$$

Call the zero-order formulation of S2 to which ξ is added subject to the scheme $\Box A\xi$, S2ξ. Quantifiers are definable in S2ξ as for SQξ. Then S2ξ contains S2Q, but it is *not* a conservative extension of it. For, in particular, the interchange principles are theorems of S2ξ. It is enough to prove $(Px)\Box A \dashvv \Box(Px)A$.

ad $(Px)\Box A \dashv \Box(Px)A$. Proof is as for S2Q: $A \dashv (Px)A$, $\Box A \dashv \Box(Px)A$, $(x)(\Box A \dashv \Box(Px)A)$, $(Px)\Box A \dashv \Box(Px)A$.

ad $\Box(Px)A \dashv (Px)\Box A$. By $A\xi$, $\Box A(\xi x A) \dashv \Box A(\xi x \Box A)$, whence the result by definition of P.

S2ξ corresponds not to S2Q but rather to the logic S2R which results from S2Q by addition of the interchange scheme $\Box(Px)A \dashv (Px)\Box A$.

While the deductive development of quantified modal epsilon systems is straightforward, and like that for corresponding relevant logics in PLO (p. 176ff.), the semantical theory takes a new turn. For in order to obtain a suitably objectual semantics – a desideratum for a theory of objects – within the scheme of things so far presented, the constant domain requirement has to be qualified. The reason is that the interpretation of $\xi x A$ may vary from world to world, e.g. it may select object 1 in world a and a different object, object 2, in world b. Nothing stops the choice made varying from world to world, and due allowance for varying choice has to be made to guarantee that $\Box A\xi$ holds generally.

[1] $\xi x{\sim}xf$ serves as an f universality indicator.

Thus an interpretation of ξxA *at* world a has to be given, i.e. $I(\xi xA, d)$ has to be defined, not just $I(\xi xA)$. Correspondingly then the interpretation of all subject terms has to be world-relativised; with the result that I now assigns to each initial term t *at* each world d in K an element of D. Likewise the rule for evaluation of initial wffis amended to

$$I((t_1, \ldots, t_n)f, a) = 1 \text{ iff } \langle I(t_1, a), \ldots, I(t_n, a)\rangle \iota I(f, a).$$

In short, models are LQ models, apart perhaps from the addition of a choice function, but an interpretation is modified in the two respects noted. A choice function c is defined on subsets of domain D as before, i.e. c is such that where D' is a nonnull subset of D, $c(D') \in D'$, and otherwise $c(D') = c(\Lambda) = c(D)$. Then the world-relativised rule for interpreting $\xi xA(x)$ is simply

$$I(\xi xA(x), d) = c\ \{I(x) \in D : I(A(x), d) = 1\}.$$

That is $I(\xi xA(x), d)$, the interpretation of ξxA at d, is a chosen element of the domain of which A holds at d. The adequacy of this objectual semantics can be established along the lines set out in PLO, p. 190ff. (or, more perfunctorily, in Slog, p. 563ff.).

World-relativisation of subject terms can be avoided by various strategies, for example, by what is straightforward but quite artificial, truth-valued semantics for ξ wff (see PLO, p. 187), or, less straightforwardly, by changing the conception of a domain to include objects such as ξ-terms pick out across worlds (cf. space-time worms across times).

Despite the fact that a perfectly satisfactory logical and semantical theory for quantified modal logics with choice operators can be supplied (with a clean healthy-living objectual semantics), such systems and their adoption have encountered heavy criticism. The main objections lodged have already been examined in detail in Slog, p. 561ff. and PLO, (p. 156ff. and p. 187ff.) and found wanting.

10. *Beyond the first-order modalised framework: initial steps*. To obtain a more adequate logical theory where a beginning can be made on the questions as to whether such attributes as existence and identity can be characterised – as distinct from introduced as primitives – quantification logic has to be expanded. The orthodox expansion consists in moving up the order-(really type-)hierarchy. There is certainly good reason to enlarge

the logical theory to (something like) second-order theory, where quantification over attributes is available, and the resultant ability to speak generally and particularly about attributes enables certain identity notions to be defined, and offers some prospect of being able to obtain similar definitions for existence, possibility, and so forth. Reformulated second-order logic has other major advantages too; in particular, while it enables much to be represented it does not really set the logic on the dangerous slopes of type theory in the way that third-order theory does. It has also disadvantages, notably in the impurity of its semantical theory (see Slog, p. 576), and in the conceptual confusion usually embodied in its intended construal and reading (that higher order predicate logic is so confused is argued in Slog, §7.12). For these reasons it is worth trying to keep some track of what calls for second-order theory and what can be formulated, or reformulated, in augmented neutral quantification logic. It will be found that much of what follows can be quantificationally expressed.[1]

§18. The neutral reformulation of mathematics and logic, and second stage logic as basic example. The need for, and shape of, enlargements upon the second stage.

There are two main steps in the neutral (i.e. nonreferential) reformulation of a mathematical or logical theory, which fully withdraws the theory from Reference Theory addiction. The steps are in every case simpler to apply if the theory has something approaching an exact logical formulation. They are:

1. The *existence*, and *quantificational, fix.* The quantifers of the theory are usually rewritten neutrally, and status predicates rewritten neutrally, e.g. "exist" or "is an entity" is replaced by "is an object", existence theorems are replaced by particularity theorems, etc.

2. The *identity fix.* Sometimes an interpretational restriction to extensional predicates is sufficient, e.g. in neutralising applications of Zermelo–Frankel set theory. Otherwise the theory is taken to include only a strong identity inapplicable to ordinary examples, or else the theory is recast with an extensional identity.

[1] An underlying thesis, that will get little exposure or defence in what follows, is that the theory of orders is unnecessary and undesirable and can and should be abandoned. The same applies to Russellian types and orders, and to levels of languages.

For anyone who rightly wishes to remove, or explicitly acknowledge, consistency assumptions along with referential ones, there is a further major step:

3. The *consistency fix*. The rule γ of Material Detachment (and perhaps other rules) are rewritten as theory-restricted admissible rules, and in case consistency of the theory cannot be satisfactorily established an overarching consistency proviso on the theory is included. If the proviso fails the theory's licence to operate is withdrawn (it is not that the theory is trivial, though that is where unqualified application of its rules would lead). A more thorough repair avoids γ altogether, and replaces the underlying logic by a paraconsistent logic (see §23 and chapter 5 [reprinted in Vol. 2 *—Eds.*]).

Several examples of neutrally and significance reformulated logics may be found in Slog, e.g. neutral significance arithmetic (p. 528) and neutral significance class theory (p. 602), along with many other examples of neutral theories, e.g. of existence (p. 529). These examples are complicated however by (what is needed in the larger view, but not important for local application) significance reformulation. The neutral part of the reformulation is often trivial: that it is is an important element in the case for the thesis that mathematics is really existence-free. Consider, for example, the two main theories developed in Mendelson 1964, formal number theory and axiomatic set theory NBG: both theories are first-order theories and may be trivially recast using neutral quantification logic as a base with neutral quantifiers. In neither case does the identity theory require adjustment: in system NBG (read in Australia at least, "No Bloody Good") there are no primitive function parameters or subject constants and but one predicate, ϵ, which is assumed extensional: while in S, where an identity predicate is primitive, there are no other primitive predicates and the functions $+$ (addition), $\times$ (multiplication) and $'$ (successor) are all transparent with respect to extensional identity.

The main illustrations in what follows will be different; they will consist of various versions of second-order logic and of λ-categorial logics (Church's simple type theory refurbished). It is useful for subsequent discussion to divide logics into two parts:

1. The *carrier* logic, or *pure structural* logic, which is the logic of the parts of speech of the system and which includes the logics of implication and inference, and

2. The *superimposed* logic, or *substantive*[1] logic, which gives the objects of the theory.

[1] Use of this term carries no commitment to the existence, in any way, of objects a logic supplies.

Second-order logic illustrates the division. All but the abstraction scheme (of the usual logic) belong to the carrier logic. But further distinctive axioms for objects, such as characterisation postulates, belong to the substantive logic.

Basic second-order logic results from quantificational, or first-order, logic Q by

(i) relaxing a formation rule of Q so that predicate and sentential parameters – recast as variables – as well as subject variables, may be bound, i.e. by replacing the formation rule specifying how "U" (read "for every") can enter into wffby the rule:

> if A is a wffthen $(Uu)A$ is a wff, where u is any variable (subject, predicate, sentential).

(ii) replacing "subject variable" whenever it occurs in the axioms and transformation rules of Q by "variable" and using in these axioms and rules extra-systematic (or syntactic) variables which range over subject, predicate or sentential variables.

These extensions are, however, insufficient to yield a Henkin-complete second-order predicate logic (in the sense of a neutralised version of the Henkin-complete second-order logic investigated in Church 1956). They yield only the carrier logic, which however merits separate display. Moreover, the elaboration required to get a Henkin-complete logic – which amounts to adding attribute abstraction schemes to the carrier logic (see below)[1] – enables important parallels for a logical theory of objects to be observed and drawn out, in particular the similarity of the addition of schemes for objects generally to schemes for certain sorts of objects, notably attributes. Such a similarity contributes nothing however to misguided attempts to reduce objects to attributes.

1. *Second-order logics and theories, and a substitutional solution of their interpretation problem*. The need to extend the logical framework beyond quantification logic at least to something like second-order logic has already been indicated: there is *much* that needs to be said in a theory of objects that cannot be expressed in Q (the full induction principle of Peano arithmetic and theses of universals theory are stereotyped examples of classical principles that cannot be adequately expressed in Q). In essence, second-order logic extends quantification logic just by allowing quantification over predicates; but it does not permit, what third and higher-order logics admit (in type restricted

[1] Or equivalently extending substitution principles, as Church does: see the formulation of second-order logic in Church 1956.

fashion), placement of predicates in subject positions – a move which raises further, and *serious*, interpretational problems. To put it bluntly, what sense does gf, e.g. "(is green) is red", make? None at all, it is not even grammatical.[1] Similarly with "(is green) is green", "(greenness) greenness", etc. A sentence requires both a subject, or subjects, *and* a predicate (both saturated *and* unsaturated expressions) and cannot be manufactured by concatenating two predicates or two subjects. To make sense of higher-order logics, implicit subject-predicate conversion principles have to be revealed. By stopping at the second order, in our ascent of the order hierarchy, we can let such sleeping problems lie. The effect, however, of higher-order theory can be obtained, in an admissible form, through conversion principles (see Slog, chapter 7).

The vocabulary of second-order logic 2Q, and of its carrier logic, and of all second-order theories, is the same as that of Q: it includes at least subject variables and predicate variables, and may include also subject and predicate constants, sentential variables and constants, and functional variables and constants. Likewise the operators are those of Q: $\&$, $\sim$, U.[2] The formation rules for wffor subjects are also the same as those for Q (those given in §16). The remaining formation rules are the following for wff:

i. An initial sentence (sentential variable or constant alone) is a wff, an elementary wff.

ii. Where $x_1, \ldots, x_n$ are n wffand f^n is an n-place predicate, $(x_1, \ldots, x_n)f^n$ is a wff, an elementary wff.

iii. Where A and B are wff, $\sim A$ and $(A \,\&\, B)$ are wff, but not elementary wff.

iv. Where A is a wffand v is any variable of any sort (subject, predicate, or sentential), $(Uv)A$ is a wff, but not an elementary wff.

The postulates for the carrier logic 2QC are as follows (they are a neutral restatement of a weak second-order logic):

1. *Sentential schemes*: $A \supset .\ A \,\&\, A, \quad A \,\&\, B \supset A, \quad A \supset B \supset .\ \sim(B \,\&\, C) \supset \sim(C \,\&\, A)$.

[1] The fact that a semantics can be provided for higher-order logics (e.g. in Henkin's fashion, Henkin 1949 and 1950), or indeed for any logic (see §24), does not show that such higher-order logics make good sense, but that having such a semantics is no guarantee of making sense.

[2] One connective and one quantifier suffice. For example, given U and $\supset$, $\sim$ and $\&$ can be defined thus: $\Lambda =_{\mathrm{Df}} (Up)p$; $\sim A =_{\mathrm{Df}} A \supset \Lambda$; $A \,\&\, B =_{\mathrm{Df}} \sim(A \supset \sim B)$.

2. *Quantificational schemes*: $(Uv)A \supset S^v_w|$, where w is a parameter (or term) of the same sort (subject, predicate, or sentential) as v (Instantiation); $(Uv)(A \supset B) \supset . \ A \supset (Uv)B$, where v is not free in A (Distribution).

3. *Detachment rules*: A, $A \supset B \rightarrow B$ (Material Detachment), $A \rightarrow (Uv)A$ (Generalisation).

Note that Material Detachment needs no qualification within the framework presented, since consistency can be proved in an appropriately finitary way. But for second-order theories in general, the rule does require qualification by a consistency provision.

There is a serious interpretational problem for the logic presented and for extensions of it, *if* the interpretation is an objectual or (differently) an entitative one. The problem (which is explained in detail in Slog, 7.12, p. 566ff. where one resolution of the problem is also offered) is this: objectual quantification in the case of many of the forms 2QC admits as well-formed does not make sense; that is, the linguistic forms, so interpreted, are not significant. The problem is evident from attempts at English renditions of simple second-order wffsuch as $(Up)p$ and $(Uf)xf$ which do not illegitimately introduce converting predicates, as the reading of $(Up)p$ as "for every proposition p, p is true" does. The problem arises from treating, in the way objectual and entitative quantification requires, predicates and sentences as subject terms (see Slog, p. 567).

The problem may be resolved, and nonsense sentences of second-order logic rendered intelligible, in various ways (ways that can be combined); for example, by transformation into attributive form (as in Slog, p. 567 ff)[1], or by recourse to a liberal substitutional interpretation of predicate and sentence quantification (a way which again introduces subjects, but quotational subjects such as $qu(f)$ and $qu(p)$). The second course will be pursued here: quantifiers and descriptors binding sentence and predicate variables will be interpreted substitutionally (or more exactly, in a generalised substitutional fashion); but operators binding subject variables will be interpreted objectually, as before. Such a mixed interpretation plan might be considered objectionable, but it is as nearly ideal as can be obtained for noneist purposes, and what is objectionable about it? An objectual interpretation is required for general and particular discourse about objects, to connect subjects with items of $d(\underline{\underline{T}})$, "language with the world". But such an objectual interpreta-

[1] For standard second-order logic omits some transformations crucial for its natural language intelligibility.

tion is not to be had or expected for other parts of speech, such as predicates, adverbs and punctuation marks, which at best yield subjects which are about objects after conversion (e.g. by prefixing by *qu*). A substitutional interpretation is however legitimate and useful for such parts of speech. Consider again the wff $(p)p$, i.e. $(Up)p$, which then reads "for every (substitution upon) sentence $qu(p)$, p", or "p, whatever sentence $qu(p)$ may be".

Naturally the substitutions are confined to an admissible class, e.g. all sentence parameters or all constants of the given language. The intelligibility of universal quantification, as in $(p)p$, construed substitutionally can be seen from the intelligibility of particular cases: suppose, e.g. the substituting sentence is "Snow is dirty-brown" (i.e. *qu* (Snow is dirty-brown)); then what is said is: Snow is dirty-brown. It is evident that $(p)p$ is false, indeed necessarily false, since some substituting sentences express falsehoods. The matter is made clearer by the semantical rules than by the barbarous rendition in logicians' English. On the intended substitutional interpretation, $(Up)p$ holds iffevery substitution for p by a sentence parameter holds.[1]

More generally, a universal quantification (over sentences or predicates of a given adicity) holds if every one of its substitution instances holds, and a particular quantification holds if some of its substitution instances hold.[2]

Adoption of a substitution interpretation also has the real advantage of much simplifying and rendering more accessible semantics for second-order logics and their elaborations. A model for 2QC is exactly the same as a model for Q, namely a structure $\langle T, D, I\rangle$.[3] The evaluation rules are those for Q together with the following rules:

(i) $I((Uf)B, T) = 1$ iff $I(B(g/f), T) = 1$ for every predicate parameter g of the same adicity (i.e. number of places) as f;

(ii) $I((Up)B, T) = 1$ iff $I(B(q/p), T) = 1$ for every sentential parameter q.

If, for convenience, sentence parameters are treated as zero-place predicate parameters, then the additions required for the second-order logic reduce to rule (i). Observe that even though predicates are assigned a relational interpretation under I and this feature is

[1] The reading and interpretation differ from that considered in Slog, p. 573, where what is considered is still an objectual interpretation, the objects being quoted sentences (or sentence "names"). Given a substitutional-style recasting the vacuous quantificational problem encountered disappears.

[2] The substitution is liberal because replacements are not restricted to constant expressions but can include other parameters, such as variables; see DS.

[3] As before T is dispensible, and if subjects are interpreted substitutionally D can be avoided also.

used in the evaluation of elementary wff, the interpretation of predicate quantification is a liberal substitution one turning on predicate replacements, which connects only obliquely through inductive interpretational clauses with the relational assignments.

Validity and other semantical notions are defined as before for Q. An adequacy theorem, of precisely the same form as that for Q, that A is a theorem of 2QC iff A is 2QC valid, may be proved in a way that simply adds to the corresponding proof for Q (details are readily assembled from DS, p. 623, or Leblanc 1976, p. 171ff.).

Logics of around second-order can similarly be built on any of the extensional enlargements of Q considered in 1.17, e.g. upon Qξ, SQξ, etc. The same also applies to logics or theories based on more substantial second-order logics, i.e. on what, seen differently, are second-order theories. A *second-order theory* is a formal system whose morphology (vocabulary and formation rules) is that of 2QC, whose axiom schemes include all those of 2QC and whose (primitive) rules are those of 2QC. A second-order theory is thus distinguished in general from the second-order logic 2QC by additional axioms – sometimes called *proper* axioms – in the vocabulary of 2QC. Naturally, constants may be singled out in a second-order theory for special treatment and the proper axioms will typically involve such constants (cf. the examples of first-order theories in Mendelson 1964, p. 58). An important class of second-order theories are those that can be distinguished roughly as second-order *logical* theories. Such systems (of which 2Q below is an example) do not involve axioms in special constants, but further axioms of a logical cast, such as abstraction schemes. For some indication of the variety of second-order logical axioms that can be considered, see Church 1956, chapter V.

2. *Substantive second-order logics with abstraction principles*. A crucial principle for many logical purposes which is omitted from 2QC is the (unrestricted) abstraction, or comprehension, scheme

UAS. $(U\underset{\sim}{x})(Pf)(\underset{\sim}{x}f \equiv A)$, with f not free in A.

Here f is a n-place predicate, for n a non-negative integer, and $\underset{\sim}{x}$ is a subject vector $(x_1, \ldots, x_n)$. The 0-place case yields the propositional scheme: $(Pp)(p \equiv A)$, with p not free in A, which enables the comprehension of a complex wffin a single parameter. The proviso on UAS is essential; otherwise inconsistency results from $(U\underset{\sim}{x})(Pf)(\underset{\sim}{x}f \equiv \sim\underset{\sim}{x}f)$. Also the quasi-constructive character of UAS, that the scheme (somehow) produces a new

predicate corresponding to A, and therewith a simple truth theory for 2QC and various extensions, are put in jeopardy should the proviso be removed (something which, though not a nontrivial possibility for second-order theory, becomes a serious matter with the rise of paraconsistent theory: see §10 above).

The system 2Q, i.e. 2QC + UAS, is simply consistent. This may be shown by essentially the finitary syntactical argument outlined in Church 1956, pp. 306–7; alternatively the result follows from the semantics to be given. The consistency of the theory depends essentially on formation restrictions, which prevent formation of such logical paradoxes as impredicativity that exploit occurrences of predicate parameters (or their conversions) in subject positions. One of the attractions of second-order theory 2Q is that it does allow unrestricted abstraction – but within the scope of its restrictive formation principles.

Logic 2Q is a neutral equivalent of the functional calculus F^2 investigated in some detail by Church 1956. To establish the equivalence involves forging a deep connection that reaches far beyond merely 2Q and neutral F^2, a connection between abstraction principles and extended substitutional principles. In the case of 2Q, which is typical, the connection is this: UAS may be replaced by the following substitution schemes, the resulting system being deductively equivalent to the original:

UST. $\quad (f)A \supset S_B^{\underset{\sim}{x}f} A|\,,$

i.e. $(f)A \supset A(B \mid \underset{\sim}{x}f)$. The complex conditions on substitution that are built into the notation are those explained in Church 1956, p. 193, or (equivalently) in Leblanc 1976, p. 167. In the 0-place case the substitution scheme takes the familiar form: $(p)A \supset S_B^p A|$. In a similar way restricted abstraction principles correspond to restricted substitution principles. For example, a *predicative* restriction on B, to the effect that B is a wffof Q, in one principle transfers intact to the other principle (and conversely). Proofs of the deductive equivalences of the systems can be adapted from Leblanc 1976, p. 175 ff . (The proofs, due to Henkin, although simple enough in outline, become difficult when the recalcitrant substitution details are incorporated in all their nicety, or nastiness.) Thus UST is a theorem of 2Q.

Semantics for 2Q and for 2QP (the system which imposes a predicative restriction on abstraction) are a matter of appropriately varying the class of substitutions admitted

in the evaluation rules for predicate and sentential quantification (cf. DS). The new rule for 2Q is, in essence:

$I((Uf)A, T) = 1$ iff $I(A(B \mid \underset{\sim}{x}f), T) = 1$
for every wff B (and where $\underset{\sim}{x}$ comprises distinct parameters).

For 2QP it is required that B be a wffof Q. Following Leblanc 1976, p. 167, call $S_B^{\underset{\sim}{x}f} A|$ a *general instance* of $(Uf)A$. Then the evaluation rule for 2Q is:

$I((f)A, T) = 1$ iff $I(A', T) = 1$, for every general instance A' of $(f)A$.

Validity is defined as for 2QC. Adequacy of the semantics for 2Q and 2QP (and for other intermediate systems) is proved like that for 2QC: for details see Leblanc 1976, p. 171ff.

A simple consequence of the abstraction principle is that everything is an item, i.e. (M1) is a weak form. For a thing is an item i ff it has some property; i.e.x item $=_{\text{Df}}$ $(Pf)xf$. But by UAS, $(Ux)(Pf)xf$; whence $(Ux)x$ item.

3. *Definitional extensions of* 2Q *and enlarged* 2Q*: Leibnitz identity, extensionality and predicate coincidence and identity*. In contrast to first-order logic Leibnitz identity may be defined in second-order theory: $u \approx v =_{\text{Df}} (f) \,.\, uf \supset vf$. The relation $\approx$ has all the expected properties, it is an equivalence relation which guarantees full intersubstitutivity. (For proofs and exact statements of substitutivity principles, see Church 1956, p. 301ff.)

But one object of the noneist enterprise is to characterise not Leibnitz identity but extensional identity, for which a preliminary characterisation of extensionality is a desideratum. While, however, one can define in 2Q, ext($\sim$), i.e. negation is extensional, ext(&), etc., one cannot define generally ext(Φ) where Φ is a sentence functor, since such functors are not included in the vocabulary. Fortunately 2Q can be enlarged, in a way that does not interfere with earlier results, by further predicate parameters which are not in turn open to quantification. That is, the enlargement is like that in enlarging sentential logic to zero-order logic, and but a syntactical enlargement extending the system conservatively. (The result of the full addition of functors of functors, subject to no axioms and not open to quantification or other binding operations, is a logic of about order $2\frac{1}{4}$.)

The first enlargement of 2Q, part of system 2Q+, is then a stock of connectives of one or more places: $\Phi^1, \Psi^1, \ldots; \Phi^2, \Psi^2, \ldots; \ldots$. Examples are "It is true that", "It is believed that", "Bill knows that", "That ... confirms that ...", "That ... entails that ...",

etc. These will be written, as in English in the case of 1-place connectives, in front of the wffthey cover (though there is some point in considering reverse notation here also, and some advantages in avoiding it). The formation rules are of this form: where Φ^n is an n-place connective (or functor), and $A_1, \ldots, A_n$ are n wff, then $\Phi^n(A_1, \ldots, A_n)$ is a wff. Then where Φ is a 1-place connective,

$$\text{ext}(\Phi) =_{\text{Df}} (p, q)(p \equiv q \supset .\ \Phi p \equiv \Phi q).$$

Similarly for n-place connectives: the definition,

$$\text{ext}(\Phi^n) =_{\text{Df}} (p_1, \ldots, p_n,\ q_1, \ldots, q_n)(p_1 \equiv q_1\ \&\ \ldots\ \&\ p_n \equiv q_n \supset .\ \Phi^n(p_1, \ldots, p_n) \equiv \Phi^n(q_1, \ldots, q_n)),$$

defines full extensionality, as applied to closed wff. (As before extensionality in each place can be defined.) The definition can be generalised, with a little complexity, to apply to predicate wffcontaining free variables, for all "functors of functors" as it said.

$$\text{ext}(\Phi^n) =_{\text{Df}} (f_1, \ldots, f_n,\ q_1, \ldots, q_n)(\underset{\sim}{x} f_1 \equiv_{\underset{\sim}{x}} \underset{\sim}{x} g_1\ \&\ \ldots\ \&\ \underset{\sim}{x} f_n \equiv_{\underset{\sim}{x}} \underset{\sim}{x} g_n \supset . \Phi^n(\underset{\sim}{x} f_1, \ldots, \underset{\sim}{x} f_n) \equiv \Phi^n(\underset{\sim}{x} g_1, \ldots, \underset{\sim}{x} g_n)),$$

where $f_1, \ldots, g_n$ are predicates of zero or more places (f_i agreeing with g_i) and $\equiv_{\underset{\sim}{x}}$ represents the universal closure on all the variables of vector $\underset{\sim}{x}$. The latter is an approximation to what cannot be formulated in usual object languages, but is perfectly admissible substitutionally and used frequently in metalogical investigations, a form quantifying over wff. The general definition, where $A \equiv_C B$ is the universal closure of $A \equiv B$ and Φ is an n-place operator (coupled if necessary with operator variables) is:

$$\text{ext}(\Phi) =_{\text{Df}} (A_1, \ldots, B_n)(A_1 \equiv_C B_1\ \&\ \ldots\ \&\ A_n \equiv_C B_n \supset .\ \Phi(A_1, \ldots, A_n) \equiv \Phi(B_1, \ldots, B_n)).$$

Note that the definitions involving bound subject variables differ from classical definitions inasmuch as classically variables are at least existentially restricted: however the main forms of interest are those containing only closed wff. The generalisation to operators is

so that it can be shown that quantifiers such as U are extensional. U is since

$$A \equiv_x B \supset .\ (Ux)A \equiv (Ux)B.$$[1]

Analogous accounts can be provided for other important classes of connectives. Thus, for instance, mod, for *modal*, is similarly defined upon strengthening initial equivalences to strict equivalences, e.g. in the simplest case: $\mathrm{mod}(\Phi) =_{\mathrm{Df}} (p, q)(\Box(p \equiv q) \supset .\ \Phi p \equiv \Phi q)$. Thus $\mathrm{mod}(\Diamond)$, but $\sim\mathrm{mod}(B_a)$, where B_a symbolises "a believes that". For epistemic functors the initial equivalences are covered by K_z, i.e. "z knows that", for suitable z; etc. So begins a significant typology of connectives.

Definitions of extensionality have been given for the main components from which languages such as second-order systems are built. There is just one crucial omission from the point of view of characterising such notions as extensional identity and (then) extensional language, and so on; and that concerns predicates. Syntactical methods of defining the extensionality of predicates in the logical framework so far elaborated break down. The two most promising approaches are these:

(1) Carnap's proposal (in MN): Use parallel definitions to those given for sentence connectives but with extensional identity in place of material equivalence in the initial places (cf. the definitions of referential transparency). But firstly the procedure is circular, and secondly there are counterexamples.[2]

(2) Routleys' proposal:[2] Define extensionality in terms of component-wise breakdown of a predicate, which reveals whether it involves a intensional functor, e.g. in the simplest case

$$\mathrm{ext}(f) =_{\mathrm{Df}} \sim(P\Phi)(Pg)(xf \equiv_x \Phi xg\ \&\ .\ \sim\mathrm{ext}(\Phi)).$$

But again there are (mostly contrived) counterexamples, and the method fails except for artificially restricted languages. Thus (2), though like (1) a *valuable* guide to extensionality, is not decisive.

But while syntactical approaches appear to fail, semantical ones do not. As observed, intensional functors all involve other worlds (than the class of worlds they are

[1] Descriptors are however still outstanding: they can be included by treating the final triple bar, $\equiv$, as an (extensional) identity.

[2] See R. and V. Routley, "Extensionality and intensionality", 1969, unpublished.

being assessed at) in their semantical evaluation. This is what is distinctive about intensional functors. Accordingly the predicate ext will be taken as a syntactical primitive henceforth: it will hold of the functor it applies to at a given world a (i.e. $I(\text{ext}(\Phi), a) = 1$) iffthe semantical evaluation of Φ in general involves no transfer from a (worlds).[1] To illustrate; in virtue of the fact that for any possible world a, $I(A \;\&\; B, a) = 1$ iff $I(A, a) = 1 = I(B, a)$, $I(\text{ext}(\&), a) = 1$; so because of the generality of a, $\Box\,\text{ext}(\&)$. Some principles which will be used in what follows emerge at once, e.g. $\text{ext}(\sim f)$ iff $\text{ext}(f)$. More important

(Ext P). A functor is extensional if it is defined in extensional terms only.

For if it is then its evaluation can never depart from the worlds where its evaluation began. It will follow using Ext P that ext(E), ext(=).

Another identity relation of some use subsequently that cannot be *adequately* defined in 2Q is predicate identity. Predicate identity, in contrast to property and attribute identity, is linguistic and language bound, is comparatively unproblematic, and is Leibnitzian in character (being like a type identity). Hence it is symbolised $\approx$. Strictly $f \approx g$ is a contraction of $\text{qu}(f) \approx \text{qu}(g)$ with the predicate $\approx$ absorbing the quotation functions. How to include predicate identity, a definition of which would involve, what is not available in 2Q+, quantification over predicates of predicates, can be inferred from the treatment of identity in first-order logic. Add $\approx$ (to 2Q+) as a primitive subject to the formation rule, where f and g are predicate parameters of the same adicity (zero or more) then $f \approx g$ is a wff, and subject to the postulates

$\approx$1. $f \approx f$,

$\approx$2. $f \approx g \supset .\; A(f) \supset A(g)$, subject to proviso I, bound variables now including predicate variables.

A suitable semantic rule is this: $I(f \approx g, T) = 1$ iff f is the same predicate as g.

Although $\approx$ can not be defined in 2Q in a way that is at all adequate as seen from the outside, e.g. when the logic is applied, from within it can be defined (up to $\equiv$). For consider accidental coincidence of predicates, in the sense of in fact having the same extension (i.e. class of values), symbolised $\sim$, and defined: $f{\sim}g =_{\text{Df}} (x)(xf \equiv xg)$.

[1] Even this method has some pitfalls. For devious rules may be chosen for the evaluation of extensional functors. It would be sad to have to fall back on canonical (semantical) forms! Fortunately that appears unnecessary.

Then $\vdash f{\sim}g \equiv .\ f \approx g$. One half is immediate from ≈2, and the other half derives by substitution. That 2Q+ makes no requisite discrimination, simply helps to reveal its inadequacy. But in this case the situation is not rectified – it is ameliorated – by going modal, by moving to □2Q. For necessary coincidence, sameness of intension in the Lewis–Carnap sense, $(x)\Box(xf \equiv xg)$, is not su ffi cient for predicate (or for that matter property) identity.

4. *Attributes, instantiation, and λ-conversion.* Much has been the talk in earlier sections of properties, relations, instantiation and so forth, but the formal theory so far advanced neither includes, nor can include fully, a direct representation of them. The introduction of attribute abstracts can however be profitably compared and contrasted with the introduction of λ-abstracts, which are in any case advantageous in several parts of the theory, beginning with the representation of complex predicates.[1] And λ-abstracts offer an attractive way of trying to rectify the omission of attribute abstracts, *despite* their different grammar.[2] Where $A(x)$ is a wffcontaining just x free, $\rho xA(x)$ is the property of all and only these elements x that satisfy A; whereas $\lambda xA(x)$ is the predicate applying to exactly those objects which are truly A. Thus $\rho xA(x)$ is a *subject* term: $\lambda xA(x)$ a *predicate* term. The same points apply to the n-place case where n variables are bound by operators ρ and λ, yielding $\rho x_1 \ldots x_n A$ and $\lambda x_1 \ldots x_n A$. Thereby also the formation rules for λ and ρ terms are indicated: where A is a wffand $x_1, \ldots, x_n$ are n distinct subject variables, $(\lambda x_1 \ldots x_n A)$ is a (complex) predicate term and $(\rho x_1 \ldots x_n A)$ is a subject term.

The postulates for λ-abstracts are Church's rules for λ-conversion. But in logics with a suitable implication connective the rules for λ conversion can, equivalently, be replaced by an axiom scheme of the following sort:

λAS. $\quad (y_1, \ldots, y_n)(\lambda x_1 \ldots x_n A) \equiv S^{x_1 \ldots x_n}_{y_1 \ldots y_n} A|$

the substitution notation representing simultaneous substitutions (which may be broken

[1] The calculus, due to Church, has several other important roles, some of which are expounded in §24, where the full calculus is introduced. Others are in providing a precise account of the connection of functions and their values, and in enabling a definition of λ-definability, an equivalent of general recursiveness.

[2] Because of the common confusion of properties and predicates λ-abstracts are often treated mistakenly as property or (worse) set abstracts.

down into a finite sequence of single substitutions,[1] and so) which may be alternatively expressed $A(y_1 \mid x_1, \ldots, y_n \mid x_n)$ or $A(y_1 \ldots y_n \mid x_1 \ldots x_n)$. Thus, e.g., $y(\lambda x\ x \sim f) \equiv y \sim f$; $(y_1, y_2)\lambda x_1 x_2 (x_1 f x_2\ \&\ \sim x_2 f y_1) \equiv y_1 f y_2\ \&\ \sim y_2 f y_1$. More generally, $(y_1, \ldots, y_n)$ are (satisfy the predicate) $\lambda x_1 \ldots x_n A$ iff $A(y_1 \ldots y_n)$, variables being duly adjusted.

The axiom scheme reflects the intended interpretation of $\lambda x_1 \ldots x_n A$ as an n-place predicate term which is true of precisely those ordered n-tuples of items which satisfy A. From this prescription the semantics of λ-abstracts can be worked out (cf. §24 below).

In fact there is no need to introduce λ as a new primitive conforming to λAS; for it can be had for free in $2Q^{\approx}$. Define $\lambda x_1 \ldots x_n A$ by identity as follows:

$$\lambda x_1 \ldots x_n A \approx f =_{\mathrm{Df}} (U x_1, \ldots, x_n)((x_1, \ldots, x_n) f \equiv A).$$[2]

Then $\lambda x_1 \ldots x_n A$ is well-defined; for in the requisite sense, for some unique f, $(U x_1, \ldots, x_n)((x_1, \ldots x_n) f \equiv A)$. The latter follows from the abstraction axiom and the postulates on $\approx$. Hence upon taking f as $\lambda x_1, \ldots x_n A$, by the definition and ≈1, $(U x_1, \ldots, x_n)((x_1, \ldots, x_n)(\lambda x_1 \ldots x_n A) \equiv A)$, whence λAS follows upon instantiation.

λ-abstraction, by enabling the definition of complex predicates, gives an *approximation* to property and attribute abstracts. For example, (internal) property negation can be approximated by $\bar{f}$ defined $\lambda x x \sim f$. Then, by λAS, since $y\bar{f} \equiv (y)(\lambda x x \sim f)$, $y\bar{f} \equiv y \sim f$. Why not introduce ρ itself to the job?

The operator ρ (like λ) could have been introduced into first-order logic, in an interesting way, in combination with the instantiation symbol ι, to yield the virtual theory of attributes. The basic definitional equivalence is simply

ρDS. $\quad (y_1 \ldots y_n)\ \iota\ \rho x_1 \ldots x_n A \equiv A(y_1 \ldots y_n \mid x_1 \ldots x_n).$

A comparison of λAS and ρDS should reveal at once why ρ and λ have often been conflated: they differ only in the insertion of instantiation predicate ι, which is easily lost sight of, and is commonly enough paraphrased in or out. The virtual theory of

[1] λ-abstraction may also be analysed into a sequence of operations, $\lambda x_1 \ldots x_n A$ into $\lambda x_1 (\lambda x_2 \ldots (\lambda x_n A) \ldots)$.

[2] Observe that there is an unfortunate visual coincidence between the reverse notation and abbreviated quantifier notation which becomes conspicuous in expressions like $(y_1, \ldots, y_n)((y_1, \ldots, y_n) f \equiv \ldots)$. Sentence context does however always guarantee distinctness.

attributes which has a nice formal development, largely parallelling Quine's elaboration of the virtual theory of sets, simply introduces ρ-terms by ρDS: it does *not* also admit ρ terms as subjects, a damaging admission, since it opens the way to logical paradoxes. The way is complete if ι is taken as wff-forming on object terms. That is, where t_1 and t_2 are subject terms $t_1\ \iota\ t_2$, i.e. $(t_1)\ \iota\ t_2$, is a wff. Then ρDS yields impredicativity paradoxes. For consider, e.g.

> $y\iota\ \rho x\ {\sim}(x\ \iota\ x) \equiv {\sim}(y\ \iota\ y)$. Then $\rho{-}\ \iota\ \rho{-} \equiv {\sim}(\rho{-}\ \iota\ \rho{-})$, which leads to inconsistency and triviality.[1]

The full admission of property and relation abstraction, along with ι, will have to await the development of paraconsistent theory of §23.

Scheme ρDS, which can be definitionally introduced at no cost, will however be occasionally exploited. Sometimes too attribute variables ψ,ϕ,... replacing abstract terms will be introduced. But in the second-order framework these additional variables are always eliminable, e.g. $(U\psi)(x\ \iota\ \psi \leftrightarrows y\ \iota\ \psi)$ which amounts to $(U\rho zzf)(x\iota\ \rho zzf \leftrightarrows y\iota\ \rho zzf\ )$ for some abstract term ρzzf, translates to $(Uf)(xf \leftrightarrows yf)$. As the use of abstract variables is informal, exact translation rules are not given.

5. *Axiomatic additions to the second-order framework: specific object axioms as compared with infinity axioms and choice axioms*. The formal investigation of second-order logics, especially that yielded by the principal Henkin interpretation in the domain of natural numbers, and that influenced by mathematical applications, often leads to the addition of further independent axioms, *not* containing any new primitive symbols beyond those of the pure logic 2Q. The more immediate and familiar of these axioms are axioms of choice and of infinity (both sorts are studied briefly in Church 1956).

The further axioms of prime interest for a logic of objects are not neutral versions of infinity and choice, but axioms supplying details of *specific* objects, Characterisation Postulates. These fall roughly into two classes, those for higher-order objects such as abstraction axioms, and those for bottom-order objects. The matter of postulates for higher-order objects is taken further in chapter 5 [reprinted in Vol. 2 *—Eds.*]; what is

[1] For this reason property and attribute abstraction *is* approximated elsewhere in the book by λ-abstraction; e.g. λxxE stands in for ρxxE, i.e. existence.

of more immediate interest are Characterisation Postulates for bottom-order objects, or *Specific Object Axioms* (SO axioms or SOA).[1]

Neutral (second-order) logic requires but one – major – addition to afford a basic logic of objects, and that consists in the addition of specific object axioms. The addition of object axioms to neutral second-order theories closely resembles the classical addition of axioms of infinity (as in Church 1956, p. 343); and indeed SO axioms can (but needn't) yield axioms of infinity. For *given* that a system includes denumerably many distinct characterising predicates, by a core object axiom, $(Px)xf$, when f is characterising, and identity principles, the upshot is denumerably many objects. Such a pure second-order object axiom follows at once from $(\imath xxf)f$ for f characterising. However SO axioms give more information than axioms of infinity, e.g. they say which properties particular objects have – hence the term "specific". In two other respects also, the comparison with infinity axioms is helpful. Firstly, there are various different nonequivalent axioms that can be chosen as axioms of infinity in a second-order setting (Church 1956 lists 5, and remarks that it is not to be expected that axioms of infinity be equivalent, and that in fact there is no weakest axiom of infinity, pp. 344–5). So it is also, it is beginning to appear, with specific object axioms. Secondly, it is impossible to provide finitary (and in a certain sense, absolute) consistency proofs for systems with axioms of infinity; so it is also with certain theories of objects with a suitably denumerable language.

A central question for the logic of objects, the precise forms of and qualifications on SO axioms, is considered in §21. One CP which has however been repeatedly encountered in particular cases is Meinong's version, a natural generalisation of which is: $A(\xi xA)$ for suitable (characterising) A. This SO axiom bears direct comparison with axioms of choice, and can indeed be accounted a (weak) axiom of choice.[2] But so far the axiom in question is not directly formalisable in the second-order logics, elaborated, since ξ is not strictly included. It is time to rectify that omission.

6. *Choice functors in enlarged second-order theory*. The first-order ξ theory transfers intact to a second-order setting. The second-order theory developed could just as easily have been based on SQξ as Q (only the new theory would not strictly be second-order,

[1] The nice term "object axiom" derives from Parsons 1978.

[2] Most obviously the CP in question is Aξ, which is usually reckoned a choice axiom, but with a different qualification. Compare too the second-order choice scheme Church presents (Church 1956, p. 341, n. 555) which is tantamount to a predicate ξ scheme.

but would add to the second-order scheme of things the description ξ). The useful system 2Qξ, which is the union of 2Q with Qξ or SQξ, may be axiomatised in various ways. A simple way is to add UST and Generalisation to SQξ. Semantics for the resultant system is a straightforward amalgamation of the respective semantics of its component systems.

What does raise new issues is the application of ξ to predicate and sentential variable, as in $\xi f A$ and $\xi p B$ i.e. higher-order ξ terms. From a truth-valued viewpoint the applications make sense. Where we can have all predicates or some sentences, we can surely have an arbitrarily selected predicate. The logic 2Qξ^2 with higher order ξ functors, simply adds to 2Qξ, as well as formation rules for higher order ξ terms, the appropriate ξ schemes, namely $A(h) \supset A(\xi f A)$, where h is a higher order term of the same adicity as f. The truth-valued semantics for ξ indicated in 1.17(9f) may be adapted. Some difficulties with ξ come however when the systems are intensionalised.

7. *Modalisation of the theories*. As before, a purely extensional logic[1] is seriously inadequate, not just philosophically but also (as is argued in chapter 10 [reprinted in Vol. 3 *—Eds.*]) in mathematics and for use in the theoretical sciences. One step beyond the extensional (almost the only step to be observed in the literature, such is the influence of the entrenched theory on what is investigated) lies the modal. Normal modalisation of second-order logics, and indeed of higher-order logics and type theories is, syntactically at least, straightforward.[2]

The recipe for a (Barcan) T modalisation (i.e. a modalisation of the order of Feys' modal system T) of almost any of the systems previously considered, and of very many other systems, is as follows: add to (a classically-based formalisation of) system L to obtain $\Box_{\mathrm{T}} L$

(1) the modal postulates of T, namely $\Box A \supset A$, $\Box(A \supset B) \supset . \ \Box A \supset \Box B$, $A \rightarrow \Box A$ (necessitation);

(2) Barcan wfffor each different sort of quantifiable variable of the system.

[1] Such a logic may admit certain nonextensional applications, as discussion of the *problem* of filtering out initial intensional predicates, in the assessment of extensional identities, has revealed. Such an admission of nonextensional initial predicates is of course no adequate substitute for an explicit theory of modality.

[2] A *normal* modal logic is semantically one that includes no nonnormal worlds, i.e. for which $N = K$. This condition models the necessitation rule, $A \rightarrow \Box A$, which is the (almost) characteristic feature syntactically, and a required feature for straightforward modalisation of classical systems which does not transform classical axioms.

For example, in the case of 2Q, $\Box$2Q includes the Barcan schemes, $(x)\Box A \supset \Box(x)A$, and $(f)\Box A \supset \Box(f)A$, where f is a predicate of zero or more places. Comparable S5 modalisations are even simpler, since Barcan wffare derivable in S5 settings. An S5 modalisation $\Box_{S5}L$ just adds the postulates of S5, which are those of T together with $\sim\Box A \supset \Box\sim\Box A$.[1]

Nor is the semantical analysis of second-order modal logics difficult, provided sense is made of such systems by a truth-valued approach to predicate and sentential quantification. (By comparison fully objectual "semantics" are much more complex.) Several second-order modal systems may be considered at once by using the notion of an *appropriate instance*, corresponding to instantiations permitted by (derived) predicate substitution schemes of the respective systems. For example, $\Box_S$2QC an appropriate instance is a predicate parameter of the same adicity, $\Box_S$2Q an appropriate instance is a general instance in Leblanc's sense (extended unproblematically to cater for modal functors). A model for an S modalisation of a second-order system L, i.e. for $\Box_S L$, is just a model for SQ. For example, a model for an S5 modalisation of 2Q, i.e. for system $\Box$2Q (abbreviating $\Box_{S5}$2Q), is an S5Q model. To complete the modelling it suffices to add these interpretation rules, of a substitutional sort, for predicate quantifiers (for predicates of zero or more places):

$I((Uf)A, a) = 1$ iff $I(A', a) = 1$ for every appropriate instance A' of $(f)A$.

Then for many second-order modal logics, theoremhood coincides with validity. Proof of soundness is the usual case-by-case affair which assembled constitutes an inductive proof. Fortunately many of the cases are already taken care of in the underlying quantified modal logic or (in effect) in second-order logic. But one use that may not be so accounted for is the matter of the validity of predicate Barcan wff. Suppose otherwise then it is not valid. For some world a in some (putative counter-)model, $I((f)\Box A, a) = 1 \neq I(\Box(f)A, a)$. Hence for some world b in K, Rab and $I((f)A, b) \neq 1$. Thus for some appropriate instance A', $I(A', b) \neq 1$. But as $I((f)\Box A, a) = 1$, $I(\Box A', a) = 1$ (since connectives, which do not bind variables, do not interfere with instances), whence as Rab, $I(A', b) = 1$, which is impossible. The completeness argument is an elaboration of that for the underlying quantified modal logic,

[1] For S5 modalisations of type theory, and semantics therefore, see especially Bressan 1972.

really of that given in 1.17 for S2Q. The elaboration is like that for second-order logic, only world relativised. What is new that has to be shown (working back from the conclusion) is that in a canonical model $(Uf)A \in a$ iff $A' \in a$, for every appropriate A'. The left-to-right half is immediate, since a is suitably closed, from the theorem $(Uf)A \dashv\exists A'$. The converse half follows from the quantifier completeness of a, something that follows in turn from an enlargement of a main extension lemma to cater for predicate quantification.

Where the underlying quantified modal logic includes ξ-terms, as well as or in place of standard neutral quantifiers (of constant domain character), constancy of domain is again modified as for the semantics of the underlying logic (see 1.17). Otherwise matters are much as before. The introduction of ξ-terms formed from predicates, i.e. expressions of the form $\xi f A$, does lead however to some new issues. Given the substitutional explanation and interpretation of quantifiers, there is, as noted, no excluding a parallel explanation of descriptors, e.g. of choice operators; for instance, given an expression of the form $A(f)$, a term $\xi f A(f)$, signifying an arbitrarily chosen linguistic unit, a predicate, for which $A(f)$ holds. But if such complex predicates are admitted, there are repercussions in the quantifier theory. For example, an ξ-predicate-term guarantees $(Pg)((Ph)xh \dashv\exists xg)$ which is not a theorem of $\Box$2Q. Thus two contrasting sets of quantifiers can be obtained in the larger ξ-theory, standard quantifiers which *exclude* ξ-terms as instances and wider quantifiers like those of LR systems, which allow ξ-terms as values. Both have their valuable uses, and there is no reason why they should not *both* be had. Since the narrower, constant domain quantifiers have already been investigated (to some extent), let us consider the stronger quantifiers that can be defined in terms of ξ, and the logic of ξ itself. The latter is (or can be, given that additional substitution requirements can be obtained by way of abstraction principles) as before, namely

$\mathrm{A}\xi^2$. $\quad A(f) \dashv\exists A(\xi f A)$.

The corresponding substitutional semantics, which in their present form at least leave something to be desired, are essentially those already indicated in 1.17 (for more details see PLO, p. 185).

The additions and enlargements made to 2Q can, in general, be carried over to $\Box$2Q. For example, predicate identity, $\approx$, can be introduced as before: its axiom schemes will then hold necessarily in virtue of the necessitation rule. Then λ-abstracts can be

defined as before, whence it follows, what characterises λ in modal contexts,

$$(y_1, \ldots, y_n)(\lambda x_1 \ldots x_n A) \mathrel{\mathfrak{E}\!\!\!\!\!\!\mathrel{-}\!\!\!\!\!\!\mathrel{3}} A(y_1 \ldots y_n \mid x_1 \ldots x_n).$$

Though modalisation is a necessary step it is only a first step in the requisite intensionalisation of logic. A further and more significant step is the introduction of a satisfactory entailment relation which paves the way also for that very important class of intensional functors of the order of strength of coentailment (see the examples cited in 11.2). But there are several unresolved problems in the application of entailment as the basic deducibility connection in advanced logical theory (e.g. the annoying matter of a satisfactory theory of restricted variables); so the logical developments that follow are built primarily on that inadequate substitute for entailment, namely strict implication. Only in §23 is entailment introduced and some of its role indicated. In a more satisfactory theory (which concerted nonclassical work would no doubt produce) entailment would replace strict implication which would be phased out: even so strict implication would of course be definable (as, e.g., that minor connective exclusive disjunction is), since a philosophically and scientifically adequate theory is just bound to include such modalities as necessity, possibility and contingency.

§19. On the possibility and existence of objects: second stage.

Some items are possible and some are not, some items exist and some do not (§17). With introduction of the logical predicates E ("exists", "is an entity") and $\diamondsuit$ ("is possible") these claims can be symbolised and some of their logical relations formulated or derived. For instance (as in §17), "Some items do not exist" is symbolised "$(Px){\sim}xE$" and "Kingfrance does not exist" "$k{\sim}E$", and that $k{\sim}E$ entails that $(Px){\sim}xE$, but that $(Px){\sim}xE$ does not entail $(Px)xE$. But in a purely quantificational setting much of what needs to be said cannot be said; for example, without modality one cannot say that it is only contingently true that things exist, and without the equivalent of second-order quantifiers one cannot explicitly[1] state even the Ontological Assumption in the form that whatever has some properties exists, much less formulate and assess many of the many definitions of existence that have been proposed.

[1] As distinct from a schematic approximation, pushing the quantifiers into the metalanguage.

A fundamental question in ontology is: can the predicates "E" and "$\Diamond$" be defined? More specifically, can they be defined using the logical apparatus already introduced? The questions cannot be exactly settled until a set of conditions of adequacy on proposed definitions is adopted. However not only would several of these conditions be controversial; also their very *statement* presupposes the correctness of certain sorts of theories. For instance, the condition of adequacy on a definition of "E" that $(Px)\sim xE$ should be a thesis legislates against classical theories, in which $(Px)\sim xE$ cannot be satisfactorily formulated. The situation is even worse with respect to the predicate $\Diamond$. However some conditions on E, such as that $(Px)xE$ and $(Px)\nabla xE$ should be theses, are virtually unquestioned. Another more important condition, supported by nonthomistic philosophical tradition, may also be stated in a theory neutral way, namely that it is contingent that what does exist exists, i.e. given xE, ∇xE. This requirement may be approximated in classical logic by the formula $\nabla(\exists x)(xf \vee \sim xf)$, i.e. it is a contingent matter that the universe is not empty: but to bring this formula out as a thesis would require a very different modalisation of classical logic from standard modalisations. In contrast the Meinongian condition on E that $\Box(Px)\sim xE$ should be a thesis is not strongly supported by philosophical tradition, cannot be formulated in a theory-neutral way, and would certainly be repudiated by those who aver that everything does exist. In sum, the issue of definition is not going to be tightly confined, let alone settled, by drawing up an uncontroversial set of conditions of adequacy. The theory of items will have to set and defend its own conditions of adequacy. The severe limitations to the vaunted neutrality of logic become very conspicuous. The limitations will appear again and again with each substantive issue that is touched: identity, descriptions, abstractions, assumptibility, and so on.

It by no means follows, of course, from the fact that conditions of adequacy, like definitions, are controversial and can always be disputed, that conditions, and proposed definitions satisfying disputable or disputed conditions of adequacy, cannot be satisfactorily defended. In what follows definitions of existence and possibility meeting the minimal conditions of adequacy so far adduced will be considered and defended and at the same time further conditions of adequacy will be derived.

1. *Item possibility: consistency and possible existence*. Unlike the case of existence, where a variety of competing definitions have been proposed, few considered definitions of item possibility are to be found in the literature. However one or other (sometimes both) of

two definitions is commonly assumed:

D◊1. $x\diamondsuit =_{\text{Df}} \diamondsuit xE$, i.e. an item is possible i ff it possibly exists;

D◊2. $x\diamondsuit =_{\text{Df}} {\sim}(Pf)(xf \ \& \ x{\sim}f)$, i.e. an item is possible i ff it has no contrary, or incompatible, features.

Observe that it would be an error to define possibility in terms of external negation (at least in the general logical framework argued for which retains LNC);[1] for then the erroneous thesis of classical rationalism, that every object is possible, would follow at once, since $(f){\sim}(xf \ \& \ {\sim}xf)$ by LNC: whereas many objects are not possible. Other definitions are soon suggested by these definitions or by other accounts in the literature. For example, D◊1, together with the classical connection xE iff $(\exists f)xf$, yields

D◊3. $x\diamondsuit =_{\text{Df}} \diamondsuit(\exists f)xf$,

and together with the nonplatonistic connection xE iff $(Pf)xf$, leads to

D◊4. $x\diamondsuit =_{\text{Df}} (Pf)\diamondsuit xf$.

Extrapolation of the impossibility definition commonly adopted for propositions, namely ${\sim}\diamondsuit p$ iff $p \dashv \Lambda$, where Λ is some logical falsehood, to all objects either leads back to D◊4, or else leads to a strengthened version of D◊4,

$$x\diamondsuit =_{\text{Df}} (Uf)\diamondsuit xf$$

as follows: ${\sim}x\diamondsuit$ iff $(Pf)(xf \dashv \Lambda)$, i.e. i ff$(Pf){\sim}\diamondsuit xf$, since ${\sim}\Lambda$ is logically true, whence $x\diamondsuit$ iff $(f)\diamondsuit xf$. But then, by abstraction, $\diamondsuit(xg \ \& \ {\sim}xg)$; so $(x){\sim}\diamondsuit x$, i.e. everything is impossible. So the strengthened version of D◊4 had better be rejected, since it violates a minimum condition of adequacy, namely $(Px)x\diamondsuit$.

Each of D◊2–D◊4 requires qualification, either explicitly to exclude certain intensional properties or through an interpretational equivalent (e.g. restricting properties to

[1] In paraconsistent logics which reject LNC there are other options for defining possibility.

Nor do the definitions discussed by any means exhaust the accounts that might be proposed. An appealing suggestion, in the spirit of Meinong, that came to hand after this section was drafted is Parson's definition (in Parsons 1978), according to which an object is possible iffit is possible that an existent object has all the nuclear predicates it actually has; in symbols $x\diamondsuit$ iff $\diamondsuit(\exists y)(\text{ch}f)(\text{Actually } xf \supset .\ yf)$. The account, which is complicated (unnecessarily?) by the use of an Actuality connective, loses some of its initial appeal however by the restriction to *nuclear* predicates that is imposed. For, on the face of it (though presumably not within the confines of Parson's theory), an object that is possible as far as its nuclear features go may be rendered impossible by some extranuclear features it has. If the restriction to nuclear predicates is removed, another restriction, that to extensional predicates, will be wanted.

extensional properties). But the explicit and honest course we have been following is, as usual, best. Such a qualification is essential, because (to take D◊2) one cannot render an object impossible by having or adopting inconsistent propositional attitudes towards it, e.g. by thinking inconsistently about it. Likewise, to take now D◊4, an object cannot be rendered possible by appropriate attitudes towards it being adopted; that someone can think of, or conceive, the round square does not make it possible.[1]

In fact D◊4 and D◊3 can be eliminated without further ado because they render some impossible objects possible. Consider the rather indeterminate coloured round square (I am now thinking of). It is possibly blue, i.e. it is possible that it is blue. Thus according to D◊4 that round square is possible; but obviously it is an impossible object. D◊3 may be similarly disposed of if any properties exist, or (with a slight variation) possibly exist; while if no properties possibly exist, the definition would render all objects impossible, violating minimal adequacy conditions.

Various restrictions of the quantifier of D◊2 suggest themselves, the most promising being to extensional and to modal properties. The basic definition then, from which others will be obtained by variation, is as follows

◊1. $x\Diamond =_{\mathrm{Df}} (U \operatorname{ext} f)\sim(xf \;\&\; x\sim f)$.

Important variations are

◊2. $x\Diamond =_{\mathrm{Df}} (U \operatorname{ext} f)\sim\Diamond(xf \;\&\; x\sim f)$,

i.e. an object x is possible iffit is not logically possible that x both has and lacks f, for any trait f;

◊3. $x\Diamond =_{\mathrm{Df}} (U \operatorname{mod} f)\sim(xf \;\&\; x\sim f)$; and

◊4. $x\Diamond =_{\mathrm{Df}} (U \operatorname{mod} f)\sim\Diamond(xf \;\&\; x\sim f)$.

In defence of the basic definition ◊1 consider the equivalent formulation of it: $\sim x\Diamond$ iff $(P \operatorname{ext} \psi)(x \,\iota\, \psi \;\&\; x \sim\iota\, \psi)$. First, the RHS (right-hand side) entails the LHS: for if an item both has and lacks some trait then it cannot be a possible item. Conversely, if an item is not a consistent one this inconsistency will be shown up (is bound to be shown up) by some trait which it both has and lacks. Again it must be a trait (an extensional

[1] Cf. Reid's refutation of a long tradition in philosophy, which tied possibility to (human) conceivability, discussed in 12.1.

property), because it is common enough for people to hold inconsistent beliefs even about entities and the like.

A weakness of $\Diamond 1$ (and similarly of $\Diamond 3$) is that it does not guarantee that item possibility is a logical notion, e.g. that $x\Diamond$ iff $\Box x\Diamond$; thus too it prevents, what might be considered desirable (it is not), a reconciliation with $D\Diamond 1$, according to which also $x\Diamond$ iff $\Box x\Diamond$ (using S5 principles). This trouble $\Diamond 2$ removes. One half of the condition deriving from $\Diamond 2$, $\sim x\Diamond$ iff $\Diamond(P\,\mathrm{ext}\,\psi)(x\ \iota\ \psi\ \&\ x\sim\ \iota\ \psi)$, follows from $\Diamond 1$. In defence of the further half of $\Diamond 2$ – which is tentatively adopted as a working definition – it can be argued that if it is possible that an item both has and lacks a given trait then in some world the item must be an inconsistent one, and, hence since its *logical* properties cannot change from possible world to world (if the worlds are S5-like in structure), the item is in fact impossible. It is, as remarked, a merit of the stronger definition that it makes item possibility a fully logical notion, in the sense that if an item is possible [impossible] it is as a matter of logical necessity possible [impossible]: modal matters are logical matters.[1] The meritorious S5 features of $\Diamond$ are exhibited in the following tiny theorems, according to which an item is possible iffit is necessarily possible and iffit is possibly possible: $\vdash \Box x\Diamond \Leftrightarrow x\Diamond$; $\vdash \Diamond x\Diamond \Leftrightarrow x\Diamond$; $\vdash \Box x\Diamond \Leftrightarrow \Diamond x\Diamond$. An item is possible in some possible world iffit is possible in all possible worlds.

By the $\Diamond$ definitions and the definition of itemhood, $\vdash x\Diamond \multimap x$ item, i.e. possibilia are, as expected items (the relation is indeed an entailment). The converse naturally does not hold, and may be refuted once Characterisation Postulates are introduced. For then an item which is round and not round is an item, but an impossible one, since roundness is a trait. Possibilia (under $\Diamond$ definitions) are items that satisfy predicate LNC for traits as well as sentence LNC. Although $\vdash x\Diamond \multimap (P\psi)\Diamond x\ \iota\ \psi$, the converse, a possibility form of the Ontological Assumption (embodied in $D\Diamond 4$) is false. For a round square is round, and therefore possibly round, but it is not possible. With Characterisation Principles, counter-examples can again be made fully logical.

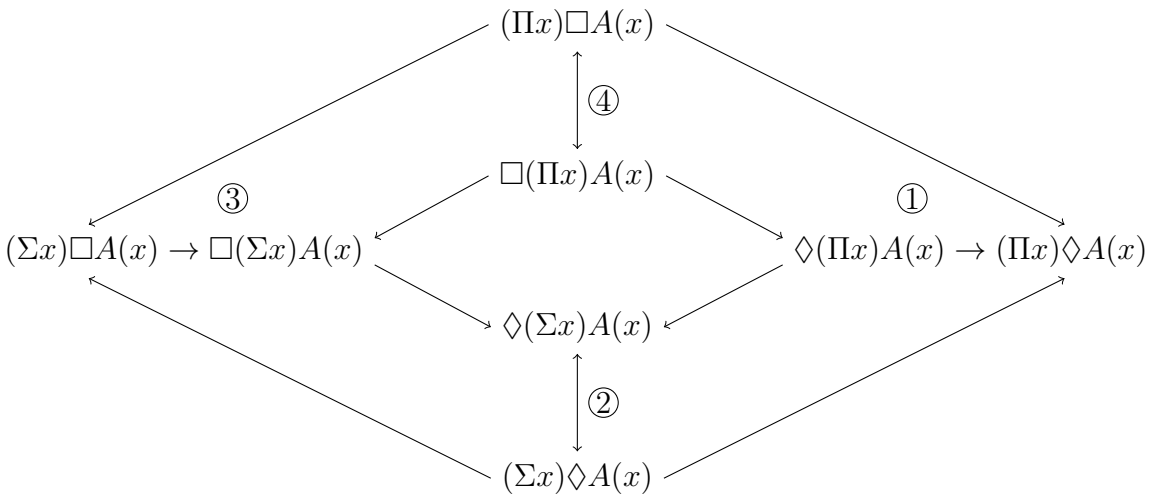
A definition of $\Diamond$ does not fully determine the logical behaviour of $\sim\Diamond$, though certain definitions, notably $\Diamond 4$, constrain it. The connective $\Diamond$ as defined in $\Diamond 2$ and $\Diamond 4$ is not (on the face of it) extensional, but it is modal. Hence instantiating with $\Diamond$,

[1] Anyone who objects to item possibility of this logical sort, who thinks that it is perfectly possible that a consistent item in fact have inconsistent traits, will of course reject $\Diamond 2$ and prefer to work with $\Diamond 1$, which does not have these S5-type features.

$x\Diamond \dashv\vdash .\ x\Diamond \dashv\vdash \sim x\sim\Diamond$, whence $x\sim\Diamond \dashv\vdash \sim x\Diamond$. But the converse does not appear to follow, presumably because of lack of an appropriate condition on predicate negation in such sentence contexts. However the following definition can consistently be adopted: $x\sim\Diamond =_{\mathrm{Df}} \sim x\Diamond$, and appears to be correct. Its adoption yields at once such tiny theorems as $\vdash x\Diamond \dashv\vdash \sim\Diamond x\sim\Diamond$ and $\vdash \sim\Diamond x\sim\Diamond \dashv\vdash x\Diamond$. Whichever way a logical notion of item possibility (i.e. a notion such that $x\Diamond$ iff $\Box x\Diamond$) is introduced, good use can be made of it in formalising and explicating what the older (and mostly wiser) logicians had to say. For example, the modal hexagon, inherited in essence from the scholastics, can be fully recovered. Possibility quantifiers – the wide quantifiers of the traditional rationalist – may be defined (using classical restricted variables) thus:

$$(\Sigma x)A(x) =_{\mathrm{Df}} (Px)(x\Diamond \,\&\, A(x)); \quad (\Pi x)A(x) =_{\mathrm{Df}} \sim(\Sigma x)\sim A(x).$$

The more satisfactory definitions from which these derive are in terms of $(Px \ni x\Diamond)A(x)$ and $(Ux \ni x\Diamond)A(x)$. Σ reads "for some possible item", Π "for every possibilium". It follows, $\vdash (\Pi x)A \dashv\vdash (Ux)(x\Diamond \supset A)$; whence the Π-interpretation result, $\vdash (\Pi x)x\Diamond$, is immediate. The principal logical relations upon combining possibility quantifiers Π and Σ with modal operators $\Box$ and $\Diamond$ – relations that follow in first-order modal theory – are summed up in the modal hexagon (adapted from Kneale[2] 1962, p. 614):



The arrows indicate strict, or material, implications. Theorems ① and ③ and the following halves of ② and ④,

(i) $\vdash \Diamond(\Sigma x)xf \dashv\vdash (\Sigma x)\Diamond xf$, and

(ii) $\vdash (\Pi x)\ xf \dashv\!\vdash \Box(\Pi x)xf$

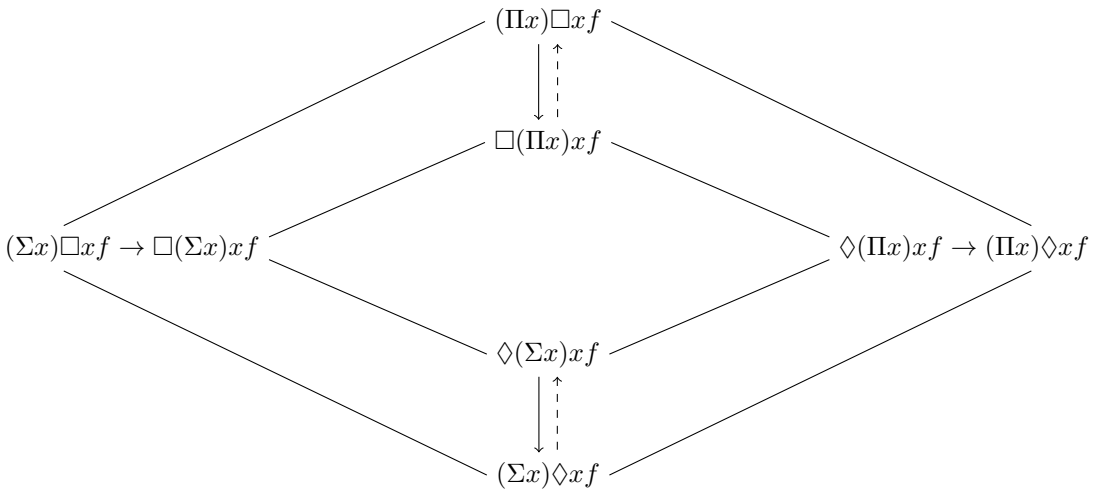
follow using the logical character of item possibility and the modal hexagon specifying relations upon combining neutral quantifiers with modalities. The remaining halves of ② and ④ follow using the strict theorem, $\vdash x\Diamond\ \&\ \Diamond A(x) \dashv\!\vdash \Diamond(x\Diamond\ \&\ A(x))$,[1] proved by contraposition from the following:

$$\begin{aligned}
\sim\Diamond(x\Diamond\ \&\ A) &\dashv\!\vdash .\ x\Diamond \dashv\!\vdash \sim A \\
&\dashv\!\vdash .\ \Box x\Diamond \dashv\!\vdash \Box\sim A, \text{ by the distinctive S3 theorem} \\
&\dashv\!\vdash .\ x\Diamond \dashv\!\vdash \sim\Diamond A \\
&\dashv\!\vdash .\ \sim(x\Diamond\ \&\ \Diamond A)
\end{aligned}$$

The correctness of the theorem depends essentially on the logical character of $\Diamond$. Otherwise, upon taking as replacement value of x "what Tom is thinking about" and as $A(\ )$ "is impossible", the following counterexample results: since what Tom is thinking about is possible though it is possible that what Tom is thinking about is impossible, it is possible that what Tom is thinking about is possible and impossible – which is impossible.

It is a common assumption that the consistency-style account of item possibility so far concentrated upon coincides, or should coincide, with the possible existence account,

[1] This theorem, which depends on features of strict implication, fails for entailment. Thus without a further assumption guaranteeing $Px\Diamond\ \&\ \Diamond A(x) \Rightarrow \Diamond(x\Diamond\ \&\ A(x))$, only a *reduced* modal hexagon emerges for entailment, viz.



The arrows indicate entailment relations. Connections on the full modal hexagon which fail (the converses of (i) and (ii)), are indicated by dotted lines.

D1. By contrast, such an assumption is not made for those special objects, propositions, to which it often claimed – with little in the way of worthwhile justificatory argument – modalities such as possibility are restricted. Platonists would have it that all propositions, including inconsistent ones, exist; and fellow-travellers are prepared to admit that inconsistent propositions at least possibly exist. But surely inconsistent objects, even abstract ones, cannot possibly exist. To go further, and spring one of the surprises of noneism: abstract objects, whether consistent or not, cannot possibly exist. The argument for this thesis will gain a prominent place subsequently (in chapter 9 [reprinted in Vol. 3 *—Eds.*]). But it is not difficult to observe the gap between consistency and possible existence through such properties as non-existence, which is a consistent notion but cannot possibly exist (see the detailed argument of NE). The immediate point is that such divergent viewpoints as platonism and noneism would lead to a divergence between possible existence and possibility in the consistency form; for example, according to noneism such objects as natural numbers though possible (and presumably objects of a consistent theory) do not possibly exist. Even so, some reconciliation of possible existence and possibility can be obtained by minor adjustment (fiddling, if you like, not fine tuning) of a definition of "exists"[1] to which classical theory naturally leads when expanded in a naive way to take account of nonexistence.

2. *Item existence*. Existence of objects is to be defined in terms of universal equivalence of predicate and sentence negation, thus

DEI. $\quad xE' =_{\mathrm{Df}} (f)x{\sim}f \equiv {\sim}xf$

so at least a sound upbringing in classical logical theory would fortify one in thinking. For consider again how negation scope differences in Russell's theory of descriptions (PM, *14) disappear just when the object described exists.[2] But more careful reflection on Russell's theory leads to qualification of DEI; for scope continues to matter in intensional frames. A definition of E, like a definition of $\Diamond$, is only satisfactory if at least restricted to traits.

[1] This was the approach of the first version of "Exploring Meinong's Jungle" [draft dated 1967 *—Eds.*].

[2] In fact diametrically opposed sources converge on a definition like E1. Not only can results of PM be rewritten to yield such a connection. Results of Meinong point to the same connection (and, as it happens, first suggested the definition); for according to Meinong (cf. Findlay 1963, pp. 178–81) what marks out existing objects is their consistency and determinacy.

Hence the mark 2 version:

E2. $\quad xE =_{\mathrm{Df}} (U \operatorname{ext} f)\,.\ x{\sim}f \equiv {\sim}xf.$

Despite the attractive logical shape of this definition, it is tempting to complicate it modally in order to secure certain prized properties, notably the consistency connection and Meinong's theorem. The complicated form is this:

E3. $\quad x\underset{\sim}{E} =_{\mathrm{Df}} (U \operatorname{ext} f)\Box(x{\sim}f \supset {\sim}xf)\ \&\ \nabla T({\sim}xf \supset x{\sim}f),$

where ∇T, i.e. "contingently true", is defined: $\nabla TA =_{\mathrm{Df}} \nabla A\ \&\ A$. It follows: $\vdash x\underset{\sim}{E} \dashv\vdash (U \operatorname{ext} f)\,.\ x{\sim}f \equiv {\sim}xf$. Further, when an individual exists all its extensional features satisfy predicate LEM; $\vdash x\underset{\sim}{E} \dashv\vdash (U \operatorname{ext} f)(xf \vee x{\sim}f)$. The definition of E (similarly of $\underset{\sim}{E}$) is a purely logical one; it makes no use of extralogical constants. In this respect at least the definition of object existence is comparable with Leibnitz's definition of object identity.

The rationale of the definitions of item existence is something like this: items which exist are fully determinate in all extensional respects. This full determinacy can be explicated logically in terms of coincidence of sentence and predicate negation.[1] Put differently, entities are complete: for each trait, an entity definitely has the trait or else lacks it.[2] But only entities are really complete; one can always turn up aspects of non-entities in which they are incomplete. So for entities, and only for entities, predicate and sentence negation coincide. The arguments given in favour of the distinction between sentence and predicate negation help clinch this point: for they all turned upon consideration of features of nonentities. In the case of entities this distinction is not needed; hence its failure to put in an appearance in standard logic texts. The idea is, that is, that entities behave, at least in extensional frames, much as they do on Russell's logic, e.g. they are complete and determinate in all extensional respects. Classical logic has got things (more or less) right as regards the extensional logical behaviour of entities: it is with respect to incomplete nonentities and intensional phenomena that it is seriously

[1] Alternatively, full determinacy may be defined as neither indeterminacy nor overdeterminacy, that is x is fully determinate $=_{\mathrm{Df}}$ ${\sim}(P \operatorname{ext} f)(x$ is incomplete wrt $f)$ & ${\sim}(P \operatorname{ext} f)(x$ is inconsistent wrt $f)$. Hence, under E2, $\vdash xE \leftrightarrows x$ is fully determinate.

[2] It is this feature that is relied upon in courtroom cross-examination procedures where the objective often is to try to determine what is real (exists), what really happened, whether the witness is lying, etc.

incomplete. That neat picture, which is still quite prevalent,[1] has to go (as Wittgenstein 1953 explained; see chapter 3 [reprinted in Vol. 2 *—Eds.*]): but for the present holding onto the picture will help.

In further support of the definition E2 consider first the unmodalised forms from which it derives. After these preliminary forms have been argued for the modal additions in the definition of $\underset{\sim}{E}$ will be examined. Consider in turn then, each entailment on which the revised definition of E' is based.

One half of the definition will follow (at least in a modal framework) if it can be established that

(a) $xE \dashv\exists \sim(P \operatorname{ext} f)(xf \;\&\; x\sim f)$ and

(b) $xE \dashv\exists \sim(P \operatorname{ext} f)(xf \;\&\; \sim x\sim f)$, i.e. $\sim\Diamond[xE \;\&\; (P \operatorname{ext} f)(xf \;\&\; \sim x\sim f)]$.

(a) follows from a requirement of adequacy on any definition of existence, that it should not be possible that an item exists which both has and lacks some extensional property; for otherwise impossibilia could exist.
(b) also looks desirable. If someone rejects the strict implication which (b) yields then he appears to be in the unfortunate position of asserting that it is possible of something which exists that it has a property though it is not the case that it lacks it. In the case of entities that can be empirically investigated it *seems* fairly clear that this is impossible.[2] For given such an entity it can, in principle be investigated whether the item has or lacks any specified feature of items of that sort; and investigation settles the matter, as an exhibitable item lacks a feature iffit is not true that it has it. There is no verifiable difference between an entity's lacking an extensional feature and the feature's not being true of it. The properties of having a property f and of not being the case that f is lacked have, that is, in the case of empirically investigatable items, all features in common; thus by an identity principle they coincide. But any entity can in principle be empirically investigated. The last claim is highly contentious. It rests either upon, what is rejected subsequently, empiricism, or upon the controversial thesis, defended subsequently, that nothing exists except particulars. Consider then particulars (if any universals exist they can be considered as a separate case). Any particular has some sort of spatio-temporal

[1] It appears also in Parsons 1978, yielding *one* of the fundamental respects in which Parsons' work differs from the present work (see further 8.7 [reprinted in Vol. 3 *—Eds.*]).
[2] If it is clear in all cases, well and good: the lucky reader can skip ahead.

or temporal locatability. Thus if a particular exists it can in principle be located and investigated by some observer. But then it would be determinate or complete with respect to every feature, as it could in principle be examined with respect to every feature. By sentence LEM the entity would either have any given feature or else it would be the case that the entity did not have it. But if it did not have an investigable feature, then applying coincidence criteria as before, it would lack it. There would be no point in denying that it lacked the feature, because this would suggest that the entity was not investigable, that we lacked data on it. Moreover if the entity were not determinate with respect to each feature, for some feature it would be false that the entity possessed it and false that it lacked it. Then we could hardly *locate* the entity. Finally, consider an arbitrary universal, if any, that exists. If it exists, then presumably it reflects particulars that exist.[1] But none of these particulars will be extensionally indeterminate, so if the universal genuinely reflects them, it will not be extensionally indeterminate.

Consider now the converse implication:

(c) $\sim xE \dashv \exists\,.\ (P\,\mathrm{ext}\,f)(x{\sim}f\ \&\ xf) \vee (P\,\mathrm{ext}\,f)(\sim xf\ \&\ \sim x{\sim}f)$

after transformation. First, if an item does not exist, then it depends for its characterisation, so both Meinong and Russell thought, upon description. For it cannot be suitably located and examined. But descriptions, even of mathematical items, are always incomplete. They do not, and cannot because of their finitude, specify how an item is with respect to the having and lacking of every property. Consider the lack of detail in descriptions of perfectly elastic balls in applied mathematics treatises. The colour of the balls, their ages and construction, are not specified; nor are these properties determinate with respect to the items. All mathematical possibilia are similarly limited. So even given a full description, for instance by specifying necessary and su ffi cient conditions, of a non-entity, the item will still not be determinate or complete with respect to all properties. Therefore sentence and predicate negation will not coincide for all predicates.

Secondly, if an item does not exist then either it is impossible or it is merely possible. If it is impossible this impossibility will be reflected in some of its properties; like Meinong's round square it will both have and lack some property. How else could the impossibility of the item emerge? More generally, any impossibilia will have some

[1] Though some such principle was adopted in most traditional theories of universals it assumes rather a lot, and has been rejected by recent platonism.

property f which violates predicate LNC, for which $x{\sim}f$ and xf are both true. If an item is merely possible, this mere possibility will be shown too in its properties, in its underdetermination with respect to the possession or lack of certain traits; like Kingfrance or a perfect gas there will be properties it neither has nor lacks. How else do we tell that possibilia don't exist? Not by search alone in most cases; for we don't, in fact can't, exhaustively search the universe or the complete decimal expansion of π. If an item is merely possible actual search will not disclose it: we are forced back to the item's characterisation. Its characterisation will be such that, like Kingfrance, for some property f it violates sentence LEM, that is $xf \vee x{\sim}f$ is false. Certain arguments of the intuitionists against LEM can also be redeployed as arguments in favour of this point; for the items the intuitionists are concerned to exclude are – according to them also, because of their constructivity criterion for existence – mere possibilia.

The arguments for (b) and (c) are by no means conclusive (it is hard to find solid arguments in this area); and as will be seen later, they are faulty. Nor are they immune to counterconsiderations. A definition based directly on predicate LNC and LEM appears especially open to various counter-examples. For instance, might it not be feasible to characterise completely a nonentity? Such definitions as: the item which has features f^i (where i ranges over some indexing set) and lacks all other properties not hereby specified in its characterisation, may be suggested. But quite apart from the self-reference in the characterisation, a counter-example has not so far been provided – so it may be claimed. For it would need to be shown that the item in question does indeed have or lack all features; and this would require the Characterisation Principle in a case where it is not available (because of predicate quantification).

It remains to explain the modalisation in the definition of $\underset{\sim}{E}$. One implication in the definiens is increased to strict implication strength to guarantee that existence entails possibility, i.e. to ensure, what does result, $\vdash x\underset{\sim}{E} \dashv\exists\, x\Diamond$. The further modalisation in the definiens is designed to guarantee the thesis that no item necessarily exists. Meinong's theorem follows using the definition, namely $\vdash {\sim}(Px)\Box x\underset{\sim}{E}$. But without the further modalisation the definition would not automatically ensure this outcome of the Independence Principle.

As well as $\vdash x\underset{\sim}{E} \dashv\exists\, x\Diamond$, $\vdash \Diamond x\underset{\sim}{E} \dashv\exists\, x\Diamond$, one half of the frequently assumed relation between item possibility and possible existence, is deducible. But the converse half,

$x\Diamond \dashv \Diamond x\underset{\sim}{E}$, is still not forthcoming, and should be rejected. Nor should it follow, as the example of nonexistence, already glimpsed, reveals. Other, but more controversial, counterexamples to linkages of the form $x\Diamond \dashv \Diamond xE$ are provided by such items as a null item, a null set, zero and infinity (on Aristotle's view), and also, rather differently, by pure incomplete objects. Consider, for instance the round squash: as a pure deductively (unclosed) object this is round and a squash and has no other properties. Thus it is incomplete, e.g. it is neither blue nor not blue. Hence it does not exist. Nor can *it* exist: to exist it would have to be completed, but any such completion is a different object. But such a pure object is possible.

The modalisation of E2 which led to E3 has its drawbacks as well as its advantages. One drawback is that "exists" ceases to be in an obvious fashion, what it is under E2, an extensional predicate. This blocks for example, the derivation as from E2 of the result $\vdash x{\sim}E \dashv {\sim}xE$.[1] A serious, connected, disadvantage is that the transparency of "exists" can no longer be established; for replacements in modal functors would be required. Under E2 however, it can be shown that $\vdash x = y \supset .\ xE \equiv yE$, as expected. This result appears more basic than the modal features E3 yield. Moreover, with the modal features one can be accused of trying to write substantial features, which should appear as axioms or consequences of axioms, into definitions.[2] There is a limit to how far the process of writing truths into definitions can be carried, it does not extend to contingent truths. It is an unquestionable fact that

E′. $(Px)xE$, i.e. some items exists –

a fact demonstrable by observation – but in any system whose structure is analytic (i.e. all axioms are logically true and rules preserve the property) no such contingent truths are derivable. However nothing prevents the addition of purely contingent postulates to a logic, and there is often good reason for introducing such postulates, e.g. in applied sciences. The addition of E′ enables the derivation not only of its logical analogue

E. $\Diamond(Px)xE$, i.e. it isn't impossible that some things exists,

[1] Even with E2 the expected relation ${\sim}xE \dashv x{\sim}E$ does not follow. This connection can however be made (quite consistently) a definitional matter: upon defining $x{\sim}E =_{\mathrm{Df}} {\sim}xE$. Hence, e.g. $\vdash \Box xE \dashv {\sim}\Diamond x{\sim}E$.

[2] But then often definitions have at least something of this role: cf. the logical reduction of mathematics to logic for a most striking example.

but also using Meinong's theorem, both the pair $\vdash (Px)\nabla TxE$ and $\vdash (Px)\nabla xE$ and the stronger pair $\vdash \nabla T(Px)xE$ and $\vdash \nabla(Px)xE$ follow.

Principle E, though necessarily true (since true, and modal), does not follow just from the modally dressed up definition E3: E will, however, follow given suitable Characterisation Postulates. To sum up: it is beginning to appear that "exists" should be extensionally defined, and the modal properties of existence located in some further principle (such as a Characterisation Principle). For this reason in particular, it seems best to resort to definition E2 of "exists".[1] Although this definition will generally be adopted in the (untensed) formal developments that follow, it is ultimately unsatisfactory (and not because it does not supply desired modal properties which can be supplied from elsewhere). Firstly, the argument that all entities are complete in all extensional respects was inconclusive: Secondly, there are counterexamples: such entities as hills, towns, forests may be indeterminate with respect to such features as their boundaries, exact size, etc. (see further chapter 3 [reprinted in Vol. 2 *—Eds.*]ff.). The diagnosis of the problem (given in chapter 9 [reprinted in Vol. 3 *—Eds.*]) will be that the restriction in E2 to extensional properties is still insufficient, that a somewhat narrower class of properties still is required. So far the logical apparatus – which has been adapted after all largely from impoverished referential enterprises – is not rich enough to delineate the class in question.

The logic is rich enough, however, to reflect some of the earlier informal discussion of objects. For instance, one can define:

x is an impossibilium $=_{\mathrm{Df}} \sim x\Diamond$

x is a (pure) possibilium $=_{\mathrm{Df}} x\Diamond \,\&\, \sim xE$

x is an entity $=_{\mathrm{Df}} xE$.

Hence $\vdash (Ux)(x$ item $\dashv\exists\dashv .\ x$ is an impossibilium $\vee$ x is a possibilium $\vee$ x is an entity); $\vdash \sim(Px)(x$ is an impossibilium $\&$ x is a possibilium); and so on.

§20. Identity and distinctness, similarity and difference and functions.

The criteria for identity and similarity of nonentities are the same as those for entities,

[1] Correspondingly to the unmodalised definition of $\Diamond$, if $xE \dashv\exists\dashv x\Diamond$ is to hold. Then such modal principles as $x\Diamond \dashv\exists\dashv \Box x\Diamond$ will have to be supplied by other than definitional resources.

namely coincidence of appropriate classes of properties of the items.[1] As in the case of entities so in the case of other items, it is important to distinguish Leibnitz identity defined attribute-wise (in the presence of strict implication – as a poor stand-in for entailment)

$$x \approx y =_{\mathrm{Df}} (U\psi)(x \iota \psi \mathrel{\text{ƪ}} y \iota \psi),$$

from extensional identity (sometimes, a little inaccurately, called contingent identity) which is defined

$$x = y =_{\mathrm{Df}} (U \operatorname{ext} \psi)(x \iota \psi \equiv y \iota \psi);$$

and each of these should be distinguished from strict identity, which is defined

$$x \equiv y =_{\mathrm{Df}} \Box(x = y).$$[2]

Each one of these identity determinates is a full equivalence relation, i.e. unconditionally reflexive, symmetrical and transitive. In contrast to Russell's theory then, identity of nonentities is unconditionally reflexive; $x = x$ irrespective of whether x exists or not. Pegasus, for instance, does not have, as it does in Russell's theory, the seemingly inconsistent feature of not being self-identical.

Without (proper) qualification of the class of transferring features in the definition of extensional identity, extensional identity would collapse into Leibnitz identity. Consider e.g. the identity I defined thus:

$$xIy =_{\mathrm{Df}} (Uf)(xf \equiv yf).$$

Then, since $xIy \mathrel{\text{ƣ}} . \; xg \mathrel{\text{ƪ}} xg \equiv xg \mathrel{\text{ƪ}} yg$, by abstraction or equivalently substitution, $xIy \equiv x \approx y$; thus also, as it turns out, Leibnitz identity may be defined in terms of material equivalence. What properly stops the invalid argument from "*a* and *b in*

[1] This account, which answers objections to nonexistent objects based on a lack of identity conditions, objections emanating from Quine's work, has recently been taken exception to by Lambert and Quine. Their new objections, which do not stand up, are considered in chapter 4 [reprinted in Vol. 2 —*Eds.*].

[2] It follows, what may be used as an alternative definition, $x \equiv y \mathrel{\text{ƪ}} (U \text{ modal } f)(xf \equiv yf)$. Firstly, if $x \equiv y$ then x and y are interchangeable in all modal contexts. Conversely, since $\Box(\ldots = x)$ is modal, given $(U \text{ modal } f)(xf \equiv yf)$, it follows $\Box(x = x) \equiv \Box(y = x)$, so $x \equiv y$.

fact have the same properties" to "a and b *necessarily* have the same properties", is the qualification in the definition of the determinate = to extensional properties.

How the different identity determinates introduced are synthesized in the one theory of identity is through the theory of logical determinables (outlined in Slog, p. 239, and explained in a preliminary way in the case of identity in EI, pp. 124–5). Identity, like most key logical notions, is a determinable under which various determinates fall.

> ... such words as "everything", "some", "same", "possible", "not" and "implies" are *logical* determinables. In each case there is a common *covering* sense, and under this a class of distinct senses, the determinate senses. For example, the word "everything" has as a covering sense that of the universality of the class of things (taken distributively) but the specification of the nature of the construction class [roughly, of the domain of things] leads to distinct senses under the cover. In one such sense, that demanded by most classical logicians, "everything exists" is true, but in another it is false; thus *salve veritate* may be used to show that the senses under the cover are distinct ... (Slog, p. 239).

With identity the determinable formula can be expressed thus: x is identical with (the same as) y iff, for every appropriate predicate[1] f, xf iff yf, where *every*, *appropriate* and *iff* are all open to determination, within bounds. A minimal form – from the two valued atemporal perspective – is provided by extensional identity.

The important respect in which the identity determinates defined differ is in the substitutivity principles which they yield. As may be shown by an inductive argument, Leibnitz identity permits intersubstitution of identicals in *all* (nonquotational) sentence frames; For this reason Leibnitz identity is a rather useless *identity* determinate in more highly intensional logic, e.g. any logic which includes epistemic functors such as "a believes that ..." or assertive functors such as "b infers that ...": it imposes more stringent requirements for coincidence of features than most true identity claims meet (see §11

[1] Strictly: predicate qu(f). Alternatively, the right-hand side of the biconditional can be expressed: for every feature, x has the feature iff y does, where now *feature* is open to determination, determination which traits (in Quine's sense) bound below. For yet further, equivalent, formulations see EI, pp. 124–5.

and also Routley and Macrae 1966).[1] For the formalisation of everyday identity claims the working determinate – the main ordinary determinate – *is extensional identity*, for identity claims of mathematics and logic some variant on strict identity.

In contrast to Leibnitz identity, strict identity only warrants intersubstitutivity in extensional and modal frames, and extensional identity just in extensional sentence frames. Because of these proper restrictions on substitution, identity puzzles like the modal paradoxes are easily resolved (as already explained in detail in §11). For instance, as (the evening star = the morning star) & ∼(the evening star ≡ the morning star), substitution of "the evening star" for "the morning star" in strict sentence frames like "□(the morning star = the morning star)" is not licensed and is evidently inadmissible. For if a and b are only extensionally identical, are one and the same at $\underline{\underline{T}}$, that gives no guarantee that they are $\underline{\underline{a}}$-identical for another possible world $\underline{\underline{a}}$; yet that is what substitution in the scope of □ would require. Similar points meet Ryle's objection (in Ryle 1972) to Meinong's theory, that Meinong is committed to denying the plain astronomical fact that the Morning Star is the same thing as Venus, that statements about the Morning Star, e.g. "It is shining brightly", are about the planetary thing, Venus. For Meinong's theory is readily extended to include the theory of identity given, under which Venus is the *same* as the Morning Star, though the items are *strictly* different.

Questions like "But what sort of identity can obtain between nonentities?", "...is the concept of identity simply inapplicable to unactualised possibles?" (Quine FLP, p. 4) are often presented as if they presented major difficulties for a theory of items. They do not (see also chapter 3 [reprinted in Vol. 2 *—Eds.*]). Various sorts of identity relations may hold between possibilia; thus Hecuba's mother ≈ Hecuba's female parent; a perfect Euclidean triangle ≡ a perfect Euclidean trilateral; but Venus = Aphrodite. Possibilia may be simply extensionally identical and not strictly identical. Consider identities like: what I am now thinking about = a unicorn. The extensional identity holds because predicates like "is horned", "is mammalian" transfer; but the identity is not strict because it is quite contingent that I was thinking of a unicorn and in a different situation my thoughts may have been otherwise directed.[2] Thus in the case of nonentities, extensional

[1] Leibnitz identity can however be assigned alternative useful roles – in nonquotational languages, where it comes close to specifying synonomy (see §24), and in language including quotation where it may serve to mark out type-identity of linguistic units.

[2] The semantics given for identity clarifies the point. Where $x = y$ & $\sim(x \equiv y)$, x and y coincide only in world T, not in all possible worlds.

identity does not vanish and cannot be replaced by strict identity. Indeed where "a" and "b" are (genuine) proper names, identity of a and b can only be extensional identity (since such identity is rock-bottom identity), and never, it would seem, strict identity. For these reasons the attempt to replace nonentities by concepts of some sort is bound to fail, since the identity conditions for concepts are at least strict. Thus for nonentities there can be no satisfactory "therapy of individual concepts" of the Church–Carnap kind.[1]

With nonentities, where affirmation of a negative feature differs from denial of a positive feature, distinctness must be distinguished from nonidentity; that is $x \neq y$, i.e. $x \sim\!= y$, distinguished from $\sim(x = y)$. Paralleling the three identity determinates, three distinctness determinates may be defined:

$$x \not\approx y =_{\mathrm{Df}} (Pf)\ .\ xf\ \&\ y\sim f;$$
$$x \neq y =_{\mathrm{Df}} (P\,\mathrm{ext}\,f)\ .\ xf\ \&\ y\sim f;$$
$$x \not\equiv y =_{\mathrm{Df}} \Box(x \neq y).$$

Thus $\vdash x \neq y \multimap y \neq x$, etc. Existence is sufficient for distinction to merge with nonidentity, i.e. $\vdash xE \multimap .\ x \neq y \equiv \sim(x = y)$.[2] In the case of nonentities $x = y$, however, it can be false that $x \neq y$ and also false that $x = y$. In such cases $x = y$ is determinate. The distinctions may be put to work in resolving puzzles concerning the incompleteness and overcompleteness of nonentities. Consider, for example, Noselfindo,[3] a (the) strictly non-selfidentical man standing in doorway d, i.e. $(\xi x)(x \not\equiv x\ \&\ xd)$. By the reflexivity of strict identity,

(i) Noselfindo $\equiv$ Noselfindo.

Applying, however, a Characterisation Principle to the characterisation of Noselfindo,

(ii) Noselfindo $\not\equiv$ Noselfindo.

Hence (i) and (ii) are overdeterminate, and their negations (i) and (ii) are indeterminate: strict self-identity and non-self-identity are overdeterminate with respect to Noselfindo. Since $\vdash (Pf)(f$ is $\sim$-overdeterminate w.r.t. $a) \multimap \sim a\diamondsuit$, it follows that Noselfindo is an impossibilium. What does *not* follow is that Noselfindo's features imply that strict identity

[1] The quotation is from Quine FLP, p. 4; see also FLP, p. 153. Carnap's therapy is set out in MN, pp. 64–8 (and elsewhere): it is criticised in chapter 4 [reprinted in Vol. 2 *—Eds.*], and also in §7 above.

[2] The converse principle, $(y)(x \neq y \equiv \sim(x = y)) \multimap xE$, though a trifle tempting, appears to be false.

[3] R. M. Chisholm suggested the character Noselfindo and some of his mates as providing counterexamples to the principle of self-identity.

is not reflexive. Nor can his mate Negselfindo, i.e. $(\xi)(\sim(x \equiv x)\ \&\ xd)$ refute the law of self-identity; for the Characterisation Principle does not have unrestricted validity (see §21), and does not extend in an unqualified way to sentence negated predicates.

Transparency or referentialness of predicates may now be defined in the formal theory, using analogues of the definition already given (on p. 133). For example,

$$\text{ref } f^1 =_{\text{Df}} (x, y)(x = y \supset .\ xf^1 \equiv yf^1);$$

and analogously for two and more place predicates,[1] extensional identity preserves truth in all places. Hence $\vdash$ ref $(=^1)$, where $x(=^1) =_{\text{Df}} x = x$; also $\vdash$ ref $(=)$, i.e. $(x, y, z, w)(x = y\ \&\ z = w \supset .\ x = z \equiv .\ y = w)$. Further $\vdash$ ref E. In fact referentialness follows at once from extensionality; $\vdash$ ext $f \supset$ ref f. Thus also predicates which are not referential are intensional. The converse connections do not hold. Some predicates which are referential are not extensional.

Familiar links between existence and identity follow: $\vdash xE \equiv (\exists y)(x \approx y)$; $\vdash xE \equiv (\exists y)(x = y)$, corresponding to a commonly used definition of E. Further $\vdash x\Diamond$ ↦ $(\Sigma y)(x \equiv y)$ and $\vdash x$ item ↦ $(Py)(x \approx y)$; items are things that are identifiable by (particular) quantification.[2]

Basic notions from the theory of meaning may be approximated in terms of identity. For example, the designation and reference relations, *des* and *ref* may be defined:

$$x\ \textit{des}\ y =_{\text{Df}} x = y; \quad x\ \textit{ref}\ y =_{\text{Df}} x = y\ \&\ yE.$$

The notions do duty respectively for qu(x) designates, or is about, y, and qu(x) refers to y, which cannot be defined until the quotation functor qu is introduced. Thus, for instance "the author of *Waverley*" refers to Scott, and the description has the reference, Scott; "Hephaistus" designates Vulcan, but does not refer to Vulcan.[3] Stronger identity determinates similarly enable the definitions of intensional meaning connexions, e.g. as

[1] The predicate definitions can be linked with property definitions through the equivalence: λf ref iff f ref, etc.

[2] This gives part of what is (trivially) correct in the slippery dictum, No object without identity, a matter farther discussed in chapters 3 and 4 [reprinted in Vol. 2 —*Eds.*].

[3] Fuller definitions exposing qu take the following lines: qu(x) signifies $y =_{\text{Df}} x = y$; qu(x) refers to $y =_{\text{Df}} x = y\ \&\ yE$. Hence $\vdash$ qu(x) has a reference ↦ $(\exists y)(x = y)$, $\vdash$ qu(x) has a reference ↦ xE, etc. Then x *ref* y ↦ qu(x) refers to y, etc; i.e. *ref* and *des* absorb qu.

noted, in quotation-free systems Leibnitz identity gives a very crude approximation to synonymy (see further §24).

Similarity determinates are defined in the same way as identity determinates, the sole difference being that the quantifier "for every" is displaced by the quantifier "for most" (for, *very* similar) or "for many". Similarly the determinable "similar to" is encapsulated by a recipe like that given for "identical to", except that "for many" again replaces "for every". As with identity, the contrast, and basic determinate is the extensional case, i.e. is extensional similarity. (Extensional) identity is the limit of (extensional) similarity, as the class of shared features increases: for what are very, very, very ... similar are (almost) identical. Just as distinctness was defined in contrast to identity, so nonsimilarity, or difference in one good sense, can be defined by contrast with similarity.

Given identity, a logical theory of functions can be designed. But it calls for some niceties that classical logic cannot express, because of its single implication and single identity. A function is a relation of two or more places satisfying certain identity conditions.[1] Evidently a function can vary according as the identity determinate in terms of which it is characterised. Thus functionality is also a determinable. The critical condition for a relation R being a function – also the key condition for the eliminability of functions – is as follows:

$$(x_1, \ldots, x_n)(P!w)R(x_1, \ldots, x_n, w),$$

i.e. for every $x_1, \ldots, x_n$, and for some unique w, $R(x_1 \ldots x_n, w)$. And how is uniqueness defined? Thus: *if* $R(x_1, \ldots, x_n, w_1)$ and $R(x_1, \ldots, x_n, w_2)$ *then* w_1 *is identical with* w_2. The underlined terms indicate determinable functors. Let us fix the conditional. Even so what counts as a function depends on an identity determinate, and strictly in place of such functions as ϕ, ψ, etc., we should write ϕ_{I}, ψ_{I}, etc., the subscript indicating the identity determinate. Thus, for example, an extensional function $\phi_{=}$ represents a relation which is unique under extensional identity, $\psi_{\equiv}$; function of the sort common in modern logic under strict identity.

Nor is that where the matter ends. It is usually supposed (correctly under prevailing assumptions) that for any function ϕ, if x is *identical with* y then $\phi(x)$ is *identical with* $\phi(y)$. Suppose ϕ is $\phi_{=}$, so that all that is required for the second identity is extensional identity. As regards the first, the conditions given may still not be strong enough

[1] Functions treated intuitively as rules come to the same.

to yield the conclusion. For example, where the first determinate is extensional identity also, the consequent will not follow from the antecedent unless ϕ is extensional in the relevant place. Thus in a proper theory of functions information is required, and should be kept track of in one way or another, not merely as to the identity determinates involved (commonly fixed for a given investigation), but also of the degree of intensionality of the relations and functions.

§21. The more substantive logic: Characterisation Postulates, and other special terms and axioms of logics of items.

The logic so far developed, though an appropriately neutral one, lacks distinctive theses of a fuller theory of objects, such as Meinong's, which ascribes extensional features to nonentities. Of course even an ontologically neutral logic is a substantial improvement on classical logic – for reasons already marshalled. The logic is, however, seriously incomplete. Though it requires, because of its two-valued sublogic, that it is either true or false that an item which is f (e.g. a round object, or object b) is f (e.g. is round), the logic does not enable us to determine whether it is true or is false, it does not help us settle *which* truth-value is taken. In particular, the logic does not yield even our initial truth-value assignments on which much of the early argument was based; it does not assign truth-value true to sentences like (1)–(4) [of §5, or analogues of these containing indefinite descriptions] and truth-value false to sentences like (5)–(6) [of §10 *—Eds.*]. Characterisation Postulates will close many of these gaps.

1. *Settling truth-values: the extent of neutrality of a logic.* It is a debatable matter how much a given logic should settle, to what extent it should delegate particular truth-values. A logic can decide *a priori* too much. An inconsistent logic is usually thought to do this. But a consistent one may too. If it followed from the logic alone that mesons or mountains on the other side of the moon did not exist (or did exist) without special contingent data added to the logic, then the logic would overdetermine truth-values. Whether a logic does overdetermine truth-values, like whether it is correct, cannot always be assessed independently of philosophical presuppositions. But a logic may decide too little, by not even settling logical matters which are within its jurisdiction. Weak modal logics like Lewis's S2 have been criticised on this sort of ground, e.g. by Carnap (in Schilpp 1963, p. 63). When purely logical matters are not resolved the validity of arguments which

depend on these points cannot be properly assessed. To that extent the logic fails in its task. But what counts as a purely logical matter is of course far from transparent.

A logic in settling even logical matters may assign truth-values, or give a recipe for determining truth-values, in a way far from philosophically neutral. Even a logic that is ontologically neutral may be far from metaphysically neutral. If the logic alone guarantees that something necessarily exists, and not merely that some existent exists, it incorporates metaphysical presuppositions. For instance, standard modalisations of classical quantification theory are justly criticised as metaphysical because they contain theses like $\Box(\exists x)(xf \vee \sim xf)$ which require for their intended interpretation that something necessarily exists. In return, the theory of existence developed here may be censured as insufficiently neutral because of its thesis that no item necessarily exists. Unremarkably, no (interpreted) logic is altogether free of philosophical presumptions; and in going on to try to settle the truth-values of sentences like (1)–(4) *within* the logic we are leaving more neutral territory.

A logic may not be intended to be philosophically impartial throughout; it may reflect in parts a particular philosophical bias; and it may just be the formalisation of a certain set of philosophical theses. Even such logics can be separated into more and less neutral segments, into pure and applied (or biassed) parts. Here results which depend on a characterisation postulate can be separated out as less central and less metaphysically neutral, much as results which depend just on classical quantification theory can be separated out as more neutral, because more readily reinterpretable in other ways, than results which depend on classical identity and description theory.

In classical logic there is a radical difference between entities and nonentities, differences particularly apparent in their treatment in description theory. Classically nonentities only get in at all by the back door, and then they have no independent logical role. For all statements apparently about them are reduced to statements about entities. The prejudice against nonentities is especially apparent in truth-value assignments. Where a is an entity classical logic decides only logical properties of a; thus the truth-value of atomic wff, such as af, are left open. But if a is a nonentity then all its properties are automatically decided. On the other hand in the ontologically neutral logic sketched so far the truth-value of atomic statements about nonentities is, like that for entities, left open. This theory and classical logic provide the two sides of the all-or-none principle.

Logic should not treat nonentities just like entities or it will fail to reveal the important logical differences between them. Moreover atomic statements about nonentities are mostly not open to resolution by extra-logical means, such as empirical ones, in the way that atomic statements about entities are. This is one reason why nonentities are of much more logical interest than entities.

To resolve cases of truth-value indecision, in the ontologically neutral logic developed, in a Meinongian way, further postulates are required, which settle the truth-values at least of certain claims of the form $\tau x(xf \ \& \ xg)f$, e.g. "a round square is round", as true. Now Meinong decided the truth-values of these sorts of claims in a way that is very tempting, and which many of us automatically adopt, and apply in arguments, especially in reductio arguments; namely, items do have the characteristics which they are truly described as having, and they do have the characteristics they are genuinely assumed to have. Thus an item if truly described as a round square is round, and a round square is also square because it is truly characterised as (a) square. The leading principle in this technique of settling truth-values can be formulated: assumed and *described items have the characteristics they* are assumed to have or are *(accurately) described as having.* If f is a characterising or defining feature or follows from a defining feature of a, then af is true. It is this Characterisation or Assumption Postulate which is responsible for many of the features of members of *Aussersein*. But it has proved a very tricky principle to control properly.

2. *Problems with an unrestricted Characterisation Postulate.* The central and most difficult part of a logic of items revolves around the bottom order Characterisation Postulate, the postulate which guarantees that the round square is round, that a golden mountain is golden, that Kingfrance is a king, and so on. For *an unrestricted Characterisation Postulate cannot be correct*; that is,

(UCP) $A(\tau xA)$, with τ some descriptor,

is false without qualification. For (1) in any nonvacuous logic some logical principles (usually distinct from UCP, but perhaps UCP itself) must be correct, say law L. Consider $\tau x \sim L$, where x is so chosen that it is not free in L. By (UCP), $\sim L$. Thus both L and

$\sim L$ are correct; inconsistency results. Put differently, given UCP, whatever L, L is refuted.[1]

Two special cases are worth noticing:

(1a) Consider an item which is both round and such that it is not the case that it is round; symbolically, where κ reads "a", $\kappa x(x \text{ rd } \& \sim x \text{ rd})$. By UCP specialised to κ, $\kappa x(x \text{ rd } \& \sim x \text{ rd})\text{rd } \& \sim \kappa x(x \text{ rd } \& \sim x \text{ rd})\text{rd}$, directly contradicting a substitution instance of LNC. This is effectively the first of Russell's two criticisms of Meinong's theory in his review of TO (Russell 1905, p. 523; also OD, p. 45).

(1b) Consider an item which, like Noselfindo, is not self identical, i.e. $\kappa x \sim (x = x)$. By UCP, $\sim[\kappa x \sim (x = x) = \kappa x \sim (x = x)]$, so contradicting a substitution instance of the reflexive law of extensional identity.

Because logical laws act as conditions they must, given simple consistency, exclude something, some presentations of some (impossible) worlds. But *any* exclusion could be violated using an unrestricted Characterising Postulate. Thus for a consistent logic, indeed for a nontrivial logic, the stark Characterisation Postulate, UCP, must be restricted – at least to some proper subclass of wff (A) and items $(\tau x A)$ within the sense of the theory.

(2) The Characterisation Postulate enables us to decide the ontological status of any item that pleases us, as we please. Suppose, for example, someone wants a philosopher's stone which exists. Then consider such a philosopher's stone; by UCP this exists. In a similar way UCP sanctions ontological proofs of *all* sorts. Sometimes this is harmless, as with a possible golden mountain, but sometimes it is disastrous, and sometimes it leads to unwanted contradictions, as in the case of an existent round square. This is Russell's second criticism of Meinong's theory of objects (see Russell 1905; also Findlay 1963, pp. 104–6). An unqualified CP thus disastrously overdetermines truth-values, and in particular ontological status. For, in any case, *assumptions* do not, and *should not settle the ontological or modal status of assumed items*: existence and possibility of items are consequential properties of items, properties which are consequential on defining features of items, but not themselves characterising features of items. To suppose that existence and possibility are characterising features would both violate the independence principle,

[1] More generally, any logic which is closed under modus ponens (for some implication), as every decent logic is, is trivial if it includes UCP, see chapter 5 [reprinted in Vol. 2 —*Eds.*].

and run head-first into the arguments in support of the thesis that existence is not a characterising property.

The only viable course open is the expected and intuitive course: to restrict the Characterisation Postulate. For the alternatives of sacrificing all other logical laws, and of admitting without control ontological proofs, are indefensible.

(3) Moreover, the unrestricted Characterisation Postulate is self-refuting. For consider: $\tau y{\sim}A(\tau x A)$, where y is not free in A. By UCP, ${\sim}A(\tau x A)$, refuting $A(\tau x A)$.

The assumption that the Characterisation Postulate cannot be duly restricted, which is very frequently used in arguing against any theory of objects, especially any theory of impossible objects, but even against theory of merely possible objects, has two main sources. Firstly, the assumption is (as explained in p. 62) a hangover of the Reference Theory, so it is unremarkable that most opponents of nonexistent items are ineluctably tempted by it. For it is assumed, given the Reference Theory, that all objects exist in some way, but what exists in fully assumptible, so all objects must satisfy an unrestricted CP. Secondly, the unrestricted CP has been confused with a freedom of assumption principle, that one can assume anything, contemplate any object at all. The Freedom of Assumption Principle is unrestricted; so, it has been invalidly inferred, must the CP be likewise unrestricted. The argument is invalid because an item may not have all the features in terms of which it is contemplated. (The differences between the Postulate and the Principle are considered in detail in chapter 6.4 [reprinted in Vol. 2 *—Eds.*].)

There is a certain obligation on any *theory* of objects however to make some distinction (preferably a viable one) between items which are assumptible – more satisfactorily whose descriptions are reliable – and those which are not. Nor can a theory of objects indefinitely escape the million dollar questions: How can the CP be (properly) restricted? Under what conditions is it correct? But the questions can be briefly postponed, and an indirect approach is definitely better.

3. *A detour: interim ways of getting by without restrictions*.[1] Let us call items which lead via the Characterisation Postulate to inconsistency "ill-behaved items". Well-behaved or

[1] Some of these sections, which in hindsight may appear as detours and false leads, reflect my gradual and haphazard workings towards progressively more satisfactory forms of the Characterisation Postulates.

fully logical items are defined thus:

$$(\tau x A(x))\,\mathrm{log} =_{\mathrm{Df}} \sim(Pq)\,.\ \Box A(\tau x A(x)) \dashv\!\vdash q\ \&\ \sim q.$$

where $A(x)$ is a wffwhich contains x free. Are ill-behaved items to be exempted from certain laws, or do they, like fully logical items, conform? It is hardly satisfactory to exempt ill-behaved items; and it is very tempting to insist on the universal validity of certain laws, that certain logical laws hold for all items, not just logical ones; for instance self-identity, $A \dashv\!\vdash A$, and sentence LNC $\sim(A\ \&\ \sim A)$. Even logically ill-behaved items are self-identical, and even of ill-behaved items it is not both the case and not the case that they have given properties. In fact we have presupposed this in the logic, and have already defined *item* accordingly. Thus the Characterisation Postulate should be restricted at least to items which do not disturb the neutral logic (or its consistency), to logical items. And the desired restriction is of course deducible. For it follows that the Characterisation Postulate holds provided $\tau x A(x)$ is a fully logical item, i.e.

IA. $\qquad (\tau x A(x))\,\mathrm{log} \dashv\!\vdash \Box A(\tau x A(x))$.

For $(\tau x A(x))\,\mathrm{log} \dashv\!\vdash (p)\Diamond(\Box A(\tau x A(x))\ \&\ \sim(p\ \&\ \sim p))$

$\dashv\!\vdash (p)\Diamond\Box A(\tau x A(x))$

$\dashv\!\vdash \Box A(\tau x A(x))$.

Hence of course $\vdash (\tau x A(x))\,\mathrm{log} \dashv\!\vdash A(\tau x A(x))$. It follows $\vdash (\sim(\tau x)\sim(x = x))\,\mathrm{log}$; $\vdash (f)\sim(\tau x(xf\ \&\ \sim xf))\,\mathrm{log}$. These examples show that IA does not suffer from those defects, listed under heading (1), that afflict the unrestricted CP. However, despite the logical demonstration of IA, it might be thought that the restriction to logical items is not sufficient, that objection (2) to a full Characterisation Postulate is not completely alleviated by a restriction to logical items. Consider, to meet one objection, an existent round nonround, i.e. $\xi x(xE\ \&\ x\,\mathrm{rd}\ \&\ x{\sim}\mathrm{rd})$. But $\vdash \sim\xi x(xE\ \&\ x\,\mathrm{rd}\ \&\ x{\sim}\mathrm{rd})\,\mathrm{log}$. For suppose an existent round non-round is a logical item. Then by IA and simplification, $\Box\xi x(xE\ \&\ x\,\mathrm{rd}\ \&\ x{\sim}\mathrm{rd})E$, i.e. it necessarily exists. But since, by Meinong's theorem, no item necessarily exists, this item does not necessarily exist. The desired theorem then follows by sentential logic. Generally, $\vdash (f)\sim\tau x(xE\ \&\ xf)\,\mathrm{log}$. Thus an existent God and the most perfect entity are not fully logical items, and simple ontological proofs are

destroyed. Nor do items which can consistently exist, but do not, raise a problem. For IA does not provide any means of strengthening possibility assertions to existence ones. Consideration of objection (2) does, however, suggest that fully logical items should be restricted to those that do not attempt to state their *own* ontological status – as does the possible perfectly elastic ball. A ban on the occurrence of ontic predicates in the characterisation A of (purely) logical item τxA would have a good rationale. But there does not seem to be any *prima facie* objection to supposing that descriptions of items can correctly state the ontological status of the items in question, provided that the descriptions are not defining or characterising descriptions. That indicates the direction of travel.

The converse, $\vdash \Box A(\tau xA(x)) \dashv\exists (\tau xA(x))\,\mathrm{log}$, of IA is simply derived:

$\sim(\tau xA(x))\,\mathrm{log}$ $\dashv\exists$ $(Pp)(\Box A(\tau xA(x)) \dashv\exists\, p \,\&\, \sim p)$

$\dashv\exists\,.$ $\Box A(\tau xA(x)) \dashv\exists (Pp)(p \,\&\, \sim p)$, changing p if necessary so that p is not free in A.

$\dashv\exists\,.$ $\sim(Pp)(p \,\&\, \sim p) \dashv\exists\,.\ \sim\Box A(\tau xA(x))$

$\dashv\exists\,.$ $\sim\Box A(\tau xA(x))$. Hence

AP. $(\tau xA(x))\,\mathrm{log} \dashv\!\vdash\exists \Box A(\tau xA(x))$.

But without sufficient conditions for an item's logicality IA and AP are rather *worthless* – unless modelling techniques are introduced. Otherwise it can never be employed in this way: if for some model of the system $(\tau xA(x))\,\mathrm{log}$ is true and all previously made assumptions of logicality are true, then adopt $(\tau xA(x))\,\mathrm{log}$ as a thesis. But such a technique is unsatisfactory: it requires semantical development for the further formalisation of the theory; without a decision procedure it is quite non-effective; and it is likely to have a damaging effect on the class of models remaining. The unsatisfactoriness of an analogous (often proposed) procedure in the face of set-theoretic paradoxes, namely keep the Abstraction Axiom provided it does not lead to inconsistency, are well-known. For subsequent developments it seems best then to bypass the notion of full item logicality (because its modalisation creates difficulties in CPs, such as ECP below) and to operate instead with a notion of item reliability which is directly linked with the UCP and to see how the circularity in its use can be removed.

4. *Presentational reliability*. Reliability, or more explicitly presentational reliability, is defined as follows, with respect to singular descriptor τ: $(\tau x A(x))\text{ass} =_{\text{Df}} A(\tau x A(x))$. Then $\vdash (\tau x A(x))\text{ass} \equiv .\ \sim(Pq)(A(\tau x A(x)) \supset .\ q\ \&\ \sim q)$. What is now called (presentational) *reliability* used to be called, and is still called at some places in the text (e.g. p. 61), *assumptibility*: hence the abbreviation to *ass*, but the older terminology is misleading: it suggests, what is wrong, that the notion corresponds to objects that can be assumed. On the contrary, however, *any* object can be assumed: by no means all of them are reliable in the way they present themselves (as $\tau x A$) as to how they are (whether they are indeed A). Failure to nail down the fundamental distinction between what can be assumed and what reliably has the features it presents itself (when assumed) as having, was a major source of trouble in Meinong's later theory (on the distinction see chapter 6.4 [reprinted in Vol. 2 *—Eds.*], and on Meinong's difficulties see chapter 12.3 [reprinted in Vol. 3 *—Eds.*]). Use of the term "assumptibility" tends to smudge that distinction.

Before sufficient conditions for item reliability are introduced, there are several observations to be made. Firstly, all the main logical systems so far developed are consistent. In the case of system 2Q, proof of simple consistency is (as observed) a mere neutral rewrite of standard proofs of consistency for second-order logic, e.g. that given in Church 1956, pp. 306–7. In case the starting system uses ξ in place of, or as well as, quantifiers, the proof is like the proof Church gives except that the logic is transformed into a prototheticformed by using the ξ-symbol in place of quantifiers. Other systems are, for the most part, proved consistent by being mapped back into one of these starting systems, by mappings like the following: predicate negation is mapped into sentence negation, sentence functors such as $\Box$ are mapped into an identity functor (which disappears), $\neg\exists$ is mapped into $\supset$, etc. That consistency can be established for such neutral logics is important: for many are they who have claimed, or else suspected, that even this much in the way of concessions to theories of objects is bound to result in formal inconsistency, that even going thus far in the direction of *Gegenstandstheorie* is going too far. Not so. Once, however, sufficient conditions for item reliability are adjoined elementary consistency proofs like these indicated mostly fail, and obtaining a consistency (or nontriviality) proof *may* become a complex task (it is not always).

Secondly, offsetting the consistency problem, it is possible to work in the logical theory at least with reliability as an hypothesis, but not asserted or even where it would certainly fail (compare the proposal in PM that the axiom of infinity be adopted as

a working hypothesis).[1] Then the full logic developed, including the theory of definite descriptions of §22, is demonstrably consistent, except insofar as item defensibility hypotheses are converted into postulates.

Thirdly, item reliability assumptions are like item existence assumptions in modern platonistic theories. In fact, where the descriptor involved is ξ, the reliability assumptions are equivalent to particularity assumptions (since $(Px)A \multimap A(\xi xA)$), so the parallel is exact, particularity precisely replacing existence on neutral rendition. It is salutory to notice what is expected and what is offered regarding existence assumptions in a platonistic theory, such as Zermelo–Frankel set theory and its elaborations. A single decisive axiom for set existence is not expected, and not offered. Rather various axiomatic conditions are adopted, and many more are considered and some of them sometimes adopted. Nobody expects anything in any way approaching a complete enumeration of existence postulates for sets (as distinct from the sets of some conventionally distinguished basic theory). As it is with set existence axioms in platonistic set theory, so it is, in some measure, with item reliability axioms.

Sufficient conditions for item reliability are, by the nature of things, somewhat piecemeal. For (so it will be argued) different sorts of things typically have their own distinctive sorts of logics. These logical differences appear not in the common carrier logic which all objects satisfy, but in the substantive postulates for objects of each sort, and so in particular in Characterisation Postulates. For example, what conditions are sufficient for abstract items will depend on the *sort* of items in question. Thus one set of conditions are correct for ZF (Zermelo–Frankel) sets, another set for NF (New Foundation) sets. There is no reason why we should not hang onto a general logical frame in which both ZF and NF set theories can be developed; and there are good reasons for doing so. In particular, it would be pleasant to provide a general theory of mathematical items, including ZF items, NF items, and other set theoretic items such as the Russell class.

There are, firstly, important differences, in Characterisation Principles, between bottom order objects and higher order objects, between particulars and abstractions. Secondly, there are significant differences between various sorts of abstract objects, between sets, propositions, attributes, and the galaxy of objects of modern mathematics. The

[1] Various of the familiar objections to this can be avoided by way of a good implication, as introduced in §23; see the discussion in chapter 11.1 [reprinted in Vol. 3 —*Eds.*].

question of Characterisation Principles for higher order objects can be conveniently set aside: it is taken up again in chapter 5 [reprinted in Vol. 2 *—Eds.*].[1] Thirdly there are differences in CPs for bottom order objects. Thus it makes a noticeable difference whether an object exists or not. This is reflected in an initial and obvious Characterisation Postulate (derivable in an augmented theory), that for existing items,

ECP. $(\xi x A(x))E \dashv\exists A(\xi x A(x))$.

5. *Characterisation Postulates for bottom order objects; and the extent and variety of such objects*. The first postulate ECP, that existence is su ffi cient for reliability, should not need much argument, since it is classically enjoined. Furthermore it is not going to lead to logical trouble by any of the familiar routes. For if an item exists then it must have consistent characterising features and so avoid objection (1) to UCP, and as it already exists an ontological proof cannot be worked on it to yield an objection of sort (2). The conditions are formulated only for ξ descriptions, though parallel conditions for definite descriptions are derivable (or else assumed).

A move no doubt seductive to rationalists is to widen the antecedent of ECP to possible items, to concede $(\xi x A(x))\Diamond \dashv\exists A(\xi x A(x))$. But such a postulate would reopen the way for ontological proofs. An existent golden mountain (the existent perfect being) is a possibilium; but were it a reliable item, then an existent golden mountain would exist, and since an existent golden mountain is a sort of golden mountain a golden mountain would exist. A qualified form of the principle

$\Diamond$CP. $A(x) \circ \sim xE \dashv\exists . \ \xi \ xA(x)\Diamond \dashv\exists A(\xi x A(x))$,

qualified by a consistency proviso, that $A(x)$ is consistent with x's nonexistence [expressed using $\circ$ *—Eds.*], appears to avoid these kinds of objections. In the case of $\Diamond$CP the qualified reliability claim holds not just contingently, as with ECP, (since nothing necessarily exists), but necessarily. For $\vdash A(x) \circ \sim xE \dashv\exists . \ (\xi x A(x))\Diamond \dashv\exists \Box A(\xi x A(x))$. Conditions like $\Diamond$CP are difficult to use because it is often difficult to establish consistency provisions. Nor is it quite obvious that the provisions are adequate. So $\Diamond$CP, unlike ECP, is not here adopted.

[1] The principles are centred on, and perhaps exhausted by, Abstraction Axioms.

Much more workable conditions which are close to the original intention and the intuitive instances of CPs take the following form:

FCP. $\Box A(\xi x A(x))$.

where $A(x)$ is a wff(containing just x free) constructed in an allowable way from characterising predicates.[1] Consistency is maintained (or triviality avoided) by limiting allowable constructions to those for which models can be found in which $A(x)$ is satisfied. For axiomatically ungoverned sets of characterising predicates this will always be the case.

Given that simple descriptive predicates such as "(is) round", "square", "golden", "(is) a mountain" are – as they will be taken to be – characterising and that conjunction and predicate negation are among allowable construction methods, logical renditions of (some) earlier preanalytic examples are readily derivable. Consider, e.g. a round non-round, represented $\xi x(xr \ \& \ x{\sim}r)$, b for short. Then, by FCP, $\Box(br \ \& \ b{\sim}r)$, whence $\Box(\xi x(xr \ \& \ x{\sim}r))r$ and likewise $\Box b{\sim}r$. Hence too $\vdash \Box{\sim}b\Diamond$; $\vdash \Box(Px){\sim}x\Diamond$; $\vdash (Px)\Box x{\sim}\Diamond$; $\vdash (Px){\sim}xE$; $\vdash \Box(Px)x{\sim}E$.

As there are various options for Abstraction Schemes to adjoin to 2QC, so there are various options for what is *allowable* in FCP. A representative restriction (from the 1969 theory) is that $A(x)$ contain only bound subject variables and predicate connectives (where predicate conjunction, &, is defined wrt arbitrary term t: $t(f \ \& \ g) =_{\mathrm{Df}} tf \ \& \ tg$).[2] A *weaker restriction* already adopted, is that $A(x)$ contain only conjunction and predicate negation. What is *not* allowable – apart from sentence negation – is *higher-order quantification*, predicate or sentential quantification, or predicates defined in terms of such quantification, notably *ontic* and *modal predicates* such as E and $\Diamond$, *logical predicates* such as $\approx$ and $=$, and *theoretical* predicates such as "determinate" and "complete".

Thereby excluded (and excluded as characterising predicates) *appear* to be all the predicates that would enable the violation of logical laws. This is not merely an ad hoc measure to preserve the consistency. For such predicates are (in a good sense) *con-*

[1] The necessitated formulation is inessential; for the necessitated form would follow from an unnecessitated form by rule necessitation.

[2] In the paraconsistent theory (of §23 ff.) an interesting restriction to contemplate is that $A(x)$ be first-order (and of course include only characterising predicates), i.e. the restriction is a *predicative* one.

The definitional equation of predicate conjunction with sentential conjunction is not uncontroversial, and Parsons suggests (in Parsons 1978) that it fails wrt dream objects. Nothing that follows really hangs on the definitional equation: if need be it can be painlessly abandoned.

sequential, i.e. depend for their determination on the prior determination of lower order ones. Hence if we allowed *a description* to determine such predicates, we could obtain by description determination of predicates which might already be *otherwise* determined. Thus we obtain inconsistency. For example, consider "the existing golden mountain", "the possible round square", "the item such that its being red logically entails its being two feet long". Such features as those so presented cannot be determined by mere description, because they hold only as a *result* or consequence of the items' possessing certain other appropriate properties and not possessing others. But since the descriptions fail to guarantee these other properties hold (and even permit the conjunction, as in the above examples, of first-order properties which would result in the non-possession of the higher-order property in question), description alone can not determine such features. The limits imposed then are intended to exclude double determination, in particular determination by description or characterisation of what is already or independently (and perhaps differently) determined (e.g. by how the world is, by other characterisation). The limits help explain two other important matters as well: Firstly, how consistency (or in paraconsistent theories nontriviality) is ensured, namely by use of predicates which have, for the item or items in question, no other restrictions imposed upon them (cf. chapter 5 [reprinted in Vol. 2 *—Eds.*]); and secondly, the point of reduced relations (to be explained in the next subsection), namely that those are subject to no violable constraints.

FCP is insufficiently strong, however *allowable* is defined within the bounds marked out. It does not enable definitely described items to have their ascriptions. The reason is that the further clause defining definite descriptions in terms of indefinite descriptions will typically involve, through an identity or distinctness clause, predicate quantification, and so prevent it being proved that the golden mountain is golden. There are several ways around this obstacle, and some classification is worthwhile because there are different routes meriting investigation.

F Routes: Stay essentially within the confines of FCP, e.g. by admitting $=$ (now as an undefined primitive into FCP),[1] or much better, by formulating FCP for descriptors other than ξ. Part of the difficulty could be avoided by extending FCP to apply directly to $\imath$ descriptions. But that, unless qualified, would lead to such erroneous results as that the golden mountain is unique among objects that are golden and mountainous (it *is* unique among objects that are *just* golden and mountainous). The trouble is easily avoided:

[1] A disastrous course: identity is an exemplary noncharacterising predicate.

adopt not (the not entirely expected) $A!(\imath xA)$, i.e. the x which satisfies A satisfies A uniquely, but simply

FCP. $A(\imath xA(x))$ with $A(x)$ as before.

Call this form of FCP, as distinct from the earlier ξ-form, the $\imath$-form. Given a suitable theory of definite descriptions, of the type eventually arrived at in §22, the $\imath$-form can be deduced from the ξ-form using the theorem: $A(\xi xB) \supset A(\imath xB)$. Thus the $\imath$-form, which is accepted, can be obtained free.

G Routes: Genuinely enlarge FCP to the following:[1]

*GCP. $B(\xi xA(x))$,

where $A(x)$ is as in FCP, and $B(x)$ is deducible from $A(x)$. (Here, even more than elsewhere, a tight account of deducibility in terms of entailment will give better results than a strict account.) As for the $\imath$-form, from *GCP it will follow (given the theory of §22) that the golden mountain is golden and is a mountain, but not that it is unique, except among items that are only golden and mountainous. Similarly all the other preanalytic working examples now follow.

There is another real point in persevering with a principle like *GCP: to take account of partial reliability. The description, $\xi x(xE \;\&\; xr \;\&\; xs)$ while not completely reliable, is at least reliable in part, as to roundness and squareness. But there is no way to use this information, no way so far to show for instance $\xi x(xE \;\&\; xr \;\&\; xs)s$. *GCP solves this problem.[2] There are however two serious hitches to *GCP.

Firstly, while FCP has a simple formulation without descriptors, as the particularisation principle[3]:

FCP′. $(Px)A(x)$, where $A(x)$ is as in FCP,

[1] As suggested in the 1969 formulation of the theory.

[2] It does not do quite enough. For it does not distinguish the round square from the existing round square. Indeed given just *GCP they are extensionally identical!

[3] Such particularisation theorems were called in an earlier version of this essay "population theorems" – a piece of terminology probably best avoided. Particularisation theorems imply that domains are never null, but mostly are large.

an ξ-free formulation of the stronger *GCP is not so readily obtained. Yet such is desirable, for ξ-theory is controversial enough in modal settings and becomes problematic where relevant connections are sought (see §23; also PLO, p. 223).

The second is more serious. *GCP is not sound, under the sort of restrictive interpretations that guarantee FCP. So long as something satisfies A all is in order: but then $A(\xi xA)$, so the principle gives no new information. Suppose however nothing satisfies A, e.g. A is (paraconsistency aside) of the form C & $\sim C$. Then ξxA may be selected arbitrarily from the domain, and so may well not satisfy B. There is no obvious or easy repair, either by varying the interpretation of ξ or by restricting A; but a principle to replace the rejected *GCP will be adduced in 8 below.

Part of the intent of *GCP was to say that given any specification some object, "suitably" arbitrary, has the characterising predicates of that specification. Thus, for some object x, for any characterising predicate f, if A determines f then xf, i.e. in symbols of 2Q+,

$$(Px)(\mathrm{ch}f)(A(f) \supset xf),$$

where the (primitive) predicate ch of predicates distinguishes characterising predicates. In 2Q+, then, where f is a one-place predicate $\mathrm{ch}(f)$ is a wff. As for other cases, $\mathrm{ch}(f)$ is often contracted to $\mathrm{ch}f$. The converse relation also appears correct for a *certain* object, not an arbitrary one, namely that given by exactly those characterisating predicates determined by A. That is, for any specification B of features of objects, there is some object x which has just the characterising features determined by B, i.e. for every f for which $\mathrm{ch}(f)$, $xf \equiv A(f)$.

To arrive at the same principle a little differently. Previously we had been looking at descriptions of objects, and asking what features an object so described has? The answers had as corollaries that there are objects of such and such sorts, as in FCP′. But we can simply ask: what bottom order objects are there (neutral "are" naturally)? The answer sought takes not the correct form "Every thing ...", but the form $(Px)D$. The familiar, and evident, assumption – that any characterisation, in terms of a set of characterising predicates, determines (exactly) an object – gives a basic answer. That is, for any specification or collection of predicates there is some object which has exactly the characterising predicates of that specification. The collection principle may be formulated

thus:

$(P\alpha)(f)(f \in \alpha \equiv A(f))$, with α a collection of predicates.[1]

Now according to the following abstraction scheme any statemental condition on predicates can be equivalently expressed through a set, i.e.

$(P\alpha)(f)(f \in \alpha \equiv A(f))$, with α not free in A.

The converse connection also holds, since trivially there is a statement condition for every set, namely that of belonging to the set. Hence the collection principle is tantamount to the specification principle already formulated, namely

HCP. $(Px)(\mathrm{ch}f)(xf \equiv A)$, with x not free in A.

That is, *for any statemental condition* (in Wood's terms, any sayso) on predicates, *some item satisfies exactly those characterising predicates which conform to the condition.* This H principle exactly mirrors an abstraction scheme. For simply rewrite HCP permuting x and f; the result is

$(Pf)(\mathrm{ch}x)(fx \equiv A)$, with f not free in A,

a predicate abstraction scheme, for some restricted class ch of objects.[2] The need for the provision on HCP is also like that on the second-order abstraction scheme. For if x were admitted free, then HCP would yield an x_1 such that for every characterising predicate f, $x_1 f \equiv {\sim}x_1 f$. That is, without the qualification, inconsistency is immediate.

The marked resemblance of HCP to the predicate abstraction axiom already adopted (and to the derivative set scheme) – namely, for any statemental condition some predicate has exactly those instances which conform to the condition – provides a good

[1] The scheme goes back, in principle, to Meinong, who "assumes that, for every subset of properties, there is in the realm of Aussersein precisely one pure object" (Grossmann, MNG, p. 167). Strictly, Meinong excluded some properties such as existence from the admissible class. He assumed of course that the object had the properties determining it.

[2] The connections suggest two things: firstly, an (uninvestigated) n-place form of HCP, namely HCP^n. $(Px_1, \ldots, x_n)((\mathrm{ch}f^n)(x_1, \ldots, x_n)f^n \equiv A)$, with $x_1, \ldots, x_n$ not free in A; and secondly, an interesting way of restricting higher order abstraction schemes for consistent theories, that to nonparadoxical subjects?

ground for accounting HCP an abstraction scheme, for objects. Accounting it such enables the extension of a thesis argued in chapter 5 [reprinted in Vol. 2 *—Eds.*], that all Characterisation Postulates (for abstract objects) are abstraction schemes.

For, what is more (but not too surprisingly given the route to HCP), the H principle enables the derivation of the weakly restricted CPs previously accepted, i.e. in effect of FCP. Let C be any wffsatisfying the weak restriction, i.e. any conjunction xf_1 & ... & xf_n where $f_1, \ldots, f_n$ are either ch predicates or the predicate negations of ch predicates, which presumably are (as it turns out) also ch predicates. To derive FCP as restricted it suffices to show $(Px)C$. Apply HCP with A as the disjunction $f \approx f_1 \vee \ldots \vee f \approx f_n$ (in fact coincidence or necessary coincidence would serve as well). Then $(Px)(f)(\mathrm{ch}(f) \supset .\ xf \equiv .\ f \approx f_1 \vee \ldots \vee f \approx f_n)$. Hence instantiating and distributing P, since $\mathrm{ch}(f_1), \ldots, \mathrm{ch}(f_n)$,

$(Px)\ .\ (xf_1 \equiv .\ f_1 \approx f_1 \vee \ldots \vee f_1 \approx f_n)$ & ... & $(xf_n \equiv .\ f_n \approx f_1 \vee \ldots \vee f_n \approx f_n)$;
whence $(Px)(xf_1$ & ... & $xf_n)$, i.e. $(Px)C$.

Adoption of HCP absolves us (for the time being at least) from the problem of explaining allowable constructions, but it does not release us from the task of characterising characterising predicates. The predicate ch, is like the predicate ext, fundamental to the theory of items; but, unlike ext, the distinction it makes has not been su ffi ciently elucidated.

6. *Characterising, constitutive, or nuclear predicates*. Thus far the elaboration of the theory of items has relied on an intuitive and rather natural distinction between "characterising" predicates such as "is round" and "is golden" and predicates which are "not characterising" such as "exists", "is possible" and "is complete". Problematic cases, such as those provided by relational predicates (as, for example, "married Joan of Arc") have been avoided (as is an author's privilege). But since the Characterisation Postulates, which are central to the theory of items, depend upon the distinction of *one-place predicates*, into characterising and not, it is important, especially for philosophical applications, and for assessment and criticism of the theory, to elaborate the distinction and to try to make it good. That does not imply obtaining necessary and/or sufficient conditions, though such conditions are desirable, and can (within limits, as will be seen) be had. A rough

nonexhaustive typology of predicates will suffice for present purposes.[1]

The distinction to be drawn is not exactly a new one but is similar to distinctions that run through the history of philosophy; for example, the traditional distinction between essence-specifying predicates and those that cannot be used in specifying the essence or nature of a thing; Frege's distinction of levels according to which "exists", unlike "is red", is a second-level predicate; Meinong's and Mally's distinction between *konstitutorisch* and *ausserkonstitutorisch* predicates which ties with Meinong's division of predicates (or rather properties) into orders; Russell's distinction of predicates (adopted in PM) into elementary and not, and the modern distinction of predicates into those that yield properties and those that do not. All these divisions make the distinction, from which a start can be made, between such predicates as "is round", "heavy", "dry", "cold", "wet", "red", on the one side and "exists" on the other. The Mally–Meinong distinction – rendered by Findlay (1963, p. 176) as a distinction between *nuclear* and *extranuclear* cases – is especially germane.[2] Meinong applied the distinction to dispose of such "Megarian subtleties" (as Findlay calls them) as that of the object d which is a specific shade of red which is simple – thus $d \approx \imath x(xr \,\&\, xs)$. If both predicates "red" and "simple" were characterising then $dr \,\&\, ds$, i.e. d is complex contradicting the simplicity of d. The resolution is simply that "is simple" is extranuclear: the simplicity of the shade of red is not a constitutive part of its nature, but is a property of "higher order" founded on the character of the object. Similarly Meinong points out (Mög, p. 176) that "is determinate" and "is indeterminate" are extranuclear; so also are such other theoretical predicates as "is complete".

Paradigmatic characterising predicates are simple descriptive predicates; paradigmatic noncharacterising predicates are ontic predicates. These classes can serve as base cases in a quasi-inductive elaboration of the distinction to be drawn.

Ch(1) *Descriptive predicates*. Included are all, or almost all, those predicates that are cited as descriptive in ethics texts, which contrast descriptive with evaluative predicates.

[1] Rarely in the history of philosophy is much more, or even as much, offered by way of explanation of basic distinctions. Outstanding cases can be decided, as ch or not, as they arise and as the theory develops (cf. what happens in chapter 7.7 [reprinted in Vol. 2 *—Eds.*]).

[2] An elaboration of this distinction is fundamental in Parsons' theory of nonexistent objects (see Parsons 1974 and 1978). Though the characterising/noncharacterising predicate distinction roughly coincides with Parsons' nuclear/extranuclear distinction for one-place English predicates, it diverges importantly as regards relational predicates, e.g. not every "plugging up" of a "nuclear relation" yields a characterising feature.

They are the familiar, ordinary predicates that would unobjectionably be used in describing or classifying a thing, or in older terms giving its essence or specifying its nature. They are the predicates that would enter unquestioned into taxonomic descriptions of species. Syntactically these predicates are of the following sorts:

(a) parts of an auxiliary verb, especially *to be*, concatenated with a descriptive adjective (predicative adjectives), e.g. "is" + "dry", "dusty", etc. Parts of other auxiliary verbs may also be used (though such examples are not paradigmatic), e.g. of *to become*, as in "become fat". (Nonentities may change over time: they are not all nontemporal.)

(b) parts of an auxiliary verb concatenated with an indefinite description of a descriptive kind, e.g. "is a triangle", "horse", "house" etc. This group broadens to include "is an old man", "is a golden mountain" etc.

(c) intransitive verbs, descriptive of actions, states, etc.; e.g. "runs", "sits", "sleeps", ... This group broadens to include verbs modified or qualified descriptively, e.g. "runs slowly" (whether descriptive of the occasion or of a disposition), as contrasted with "sleeps unintentionally".

(d) predicate negations of the predicates of the foregoing classes.

Less clearcut than Ch(1), but suggested by (d), and to some extent guaranteed by CPs, are

Ch(2) *Compounds of* ch *predicates.* Predicate conjunctions, for example, of ch predicates are ch.

Leading classes of ∼ch predicates will be already familiar:

$\overline{\text{Ch}}(1)$ *Ontic predicates.* Representative are those predicates such that they or their negations imply existence or its negation. Thus "exists" is ontic, so is "is created", "dies" etc. So also are such modal predicates as "is possible" since its negation implies nonexistence. Included in this class, too are other predicates of the modal subclass such as "is contingent".

$\overline{\text{Ch}}(2)$ *Evaluative predicates.* This class is commonly contrasted with Ch(1). Predicates such as "is good", "beautiful", ..., which are often said not to yield properties, are almost consequential on accumulation of descriptive predicates, e.g. a motor car that satisfies a string of predicates such as "is rusty", "has bald tyres", "lacks instruments", etc., virtually excludes satisfaction of the predicate "is good".

$\overline{\text{Ch}}(3)$ *Theoretical predicates.* These include not only predicates of the theory of items itself, such as "is determinate", "complete", etc., but also such predicates as "simple". They are excluded for reasons like those Meinong adduced.

$\overline{\text{Ch}}(4)$ *Logical predicates.* Prime examples are identity determinates. Other examples are predicates from set and attribute theory, e.g. set membership. To see the point of excluding extensional identity, consider ξx (x is prime minister of Australia & x = President Carter). If FCP applied it would follow that President Carter is prime minister of Australia.

$\overline{\text{Ch}}(5)$ *Intensional predicates.* Typical are predicates such as "is much sought after", "is often thought about", "is observed (by d)", "is believed in". None of these predicates serve in genuinely characterising an object, e.g. d's observing the cheese is not part of the nature of the cheese and makes no difference to how it is. The restriction of characterising predicates to the extensional is important in allowing intensional attitudes to be freely taken up towards arbitrary objects delivered by the axioms.[1]

A theory of objects itself helps to enforce the requisite distinctions. Suppose E, i.e. "exists", were characterising. It is given by Ch(1), as paradigmatic, that $\text{ch}(r)$ where r is, say, "is round". Then by FCP, dr & $d{\sim}r$ & dE where $d \approx \xi x(xr$ & $x{\sim}r$ & $xE)$. But as $\text{ext}(r)$, dr & $d{\sim}r \supset .\ {\sim}dE$ which is impossible. Hence ${\sim}\text{ch}(E)$. Parsons has in effect observed (in Parsons 1978) that given *some* predicates from Ch(1) are indeed ch, very *many* predicates of classes $\overline{\text{Ch}}(1)$–$\overline{\text{Ch}}(5)$ can be shown to be correctly assigned by applying HCP. One consequence of HCP, using the Abstraction Axiom, is

(P) If for some set α of ch predicates to which g does not belong, every object that satisfies every predicate of α satisfies g, then ${\sim}\text{ch}(g)$.

For let A determine α. Consider $t \approx \xi x(\text{ch}f)(xf \equiv A(f))$. By HCP, $(\text{ch}f)(tf \equiv A(f))$, so $\text{ch}(g) \supset .\ tg \equiv A(g)$. By the antecedent of P, tg and ${\sim}A(g)$, whence ${\sim}\text{ch}(g)$. To show that "is impossible", for instance, is ${\sim}$ch, set $\alpha = \{r, {\sim}r\}$. "Is impossible" does not belong to α and every object x such that xr & $x{\sim}r$ is impossible, whence, by P, ${\sim}$ch (is impossible). Similarly for many other noncharacterising predicates (sometimes using however variations upon P) .

The main problematic classes concern relational predicates (expressions of the form $(a_1, \ldots, x, \ldots, a_n)f$ after abstraction) which relate or compare nonentities and entities.

[1] Also intensional predicates could induce relations to entities that these latter may not have.

Whether such one-place predicates are characterising depends *both* on the many-place predicates involved *and* on the terms occupying the other places and their arrangement. Although the ch/nonch distinction already delineated *can* be extended beyond one-place predicates – for instance, descriptive predicates are often ch, logical and theoretical predicates never are – it is by no means the case that a many-place normally characterising predicate all of whose places are occupied, except one, is a ch predicate: the occupied places must be satisfactorily filled as well. For example, a term which includes quantifiers or intensional or nonch predicates (as, e.g. $\xi x(xE \ \& \ xh)$) will not be accounted satisfactory.

Ch(3) *Relational predicates* of the form $(x, a_2, \ldots, a_n)f$ which are extensional in their one (main)place, which contain a "descriptive" predicate f, and remaining constant terms $a_2, \ldots, a_n$ are either (free) names or descriptions which include no nonch components. To explain why this class of predicates appears to cause especial difficulties, consider expressions of the form "a R-ed b" where "R" represents some verb such as "kill", "marry", "assault", "touch", "kick", etc., and b is a nonentity. Suppose, it is said, that (the x)(x R-ed b) is reliable. Abbreviating $\imath x(x \ R\text{-ed} \ b)$ by the (name) term d, by the basic Characterisation Postulate,

(i) d R-ed b.

Then by the normal passive transformation,

(ii) b was R-ed to [by] d,

i.e. sometimes b R-ed d. But, for a large class of relations, including all the examples cited, it then follows

(iii) b was R-ed (sometimes, b $\breve{R}$).

To illustrate: Let $d = \imath x(x$ married Joan of Arc).

Then, by the CP, d married Joan of Arc; so Joan of Arc was married to d, and so Joan of Arc was married – which is false. The argument leads from true premisses to false conclusions, and hence is invalid. The problem is to locate where the trouble lies. There are three options for a consistent theory (paraconsistency offers no further viable option here):

(a) Such predicates as "R-ed b" are not characterising, at least where b is an entity.

(b) The passive conversion fails in such cases.

(c) The transitive-intransitive inference fails.

It will be argued that (b) is the most feasible option for a theory of objects, and that, despite perhaps initial appearances, it is unproblematic. It is important to observe that neither traditional nor classical logic supply the inferences that are in question; so that in questioning (b) or (c) central logical principles are not being upset. Principles guaranteeing inferences like (b) and (c) are sometimes tacked on in applications of logical theory, e.g. as postulates (cf. Carnap's meaning postulates of MN, p. 227, and the relational postulates for axiomatic geometry): but nothing stops their variation when a wider domain of objects is considered, and especially when impossible objects which are liable to upset "meaning postulates" are included.

Adopting option (a), though no doubt (in the light of classical theory) a consistent procedure, is crippling: it would rule out much that a theory of items aims to accomplish, and take it part way back towards the classical position that nonentities have no properties. For it would prevent Kingfrance from being a king *of France*, at most he would be a king; and it would rule out the obvious way of distinguishing him from a king of China, also a king. It would exclude Sherlock Holmes, as the detective who lived in London, ..., from living in London or anywhere else on earth. In addition, (a) would require the back-up of a sharp division of one-place predicates into pure or qualitative predicates as opposed to relational predicates. Such a distinction is problematic; it is difficult to make out, or maintain, without recourse to, what is independently objectionable, and best avoided, rigid primitive forms, that is to some form of atomism.

Option (c), while harder to defeat conclusively than might have been anticipated, appears implausible. Consider the woman who inhabits the centre of the earth, call her c. Then according to option (c), the centre of the earth is inhabited by c, and so is inhabited by someone but it is not inhabited. Similarly France is ruled by king d (d being the king who rules France), but is not ruled and is not (in *one* sense) a monarchy. (Even so (c) is left slightly open.)

Option (b) escapes these difficulties. It can allow the natural inference from "inhabited by c" to "inhabited" – at the cost, it will be said, of blocking the equally natural inference from "c inhabits the centre of the earth" to "the centre of the earth is inhabited by c". But is the passive conversion any more "natural" than the inference already

blocked, in some cases, from "a is not round" to "It is not the case that a is round"? The claim will be that while the conversion is – like the predicate to sentence negation transformation – correct in many cases, e.g. where the relata are entities, it is not correct in all cases. One reason is this. While it is true (in a good intuitive sense) that Sherlock Holmes inhabited London, and true of Holmes that he did this, it is not true of London that it had Holmes as an inhabitant or resident. Yet the passive conversion, which enables the conversion of a relational property of d to b into a property of b, would allow us to conclude that it is true of London that Holmes was among its inhabitants. When are such transformations as passive conversion admissible?

7. *Entire and reduced relations and predicates*. Entire relations are those which to put it roughly, satisfy the full range of classically expected logical relations and inferences. For example, if *due south of* is entire then it will be (at least in all ordinary terrestial contexts) transitive, asymmetric and irreflexive, it will permit passive conversions, and also replacement of each relatum by extensional identicals. By contrast, reduced relations satisfy only a reduced class of these features. An occurrence of a many-place predicate is said to be *entire* or *reduced* according as the relation signified is entire or reduced. For example, the occurrence of "lived at" in "Holmes lived at 221B Baker St., London"' is a reduced occurrence; for passive conversions is excluded, and so is replacement of identicals, e.g. even if 221B Baker St. is, or was, (as D. Lewis suggested) a brewery, it would not be legitimate to infer that Holmes lived at a brewery.[1]

Adoption of the entire / reduced distinction is no concession to the Reference Theory. For the necessary and sufficient conditions for the entireity of relations are not that the relations exist, or even that the relations are extensional and that the relation exists. Entire extensional relations may hold between nonentities, and even between entities and nonentities (see especially chapter 9 [reprinted in Vol. 3 *—Eds.*]). Relations of the working logic are (taken to be) reduced unless otherwise indicated, e.g. by explicit say so or through devices such as superscripting.

The notion of entireity may be extended to one-place predicates (though no use will be made of it in this connection, and it can be misleading) and also to statements. A statement is entirely true if, again roughly, it is true and all classically expected (but

[1] Reduced occurrences of predicates connect with contextually intensional occurrences, as will become clearer in chapter 7 [reprinted in Vol. 2 *—Eds.*], §7.

neutralised) inferences are warranted. Thus, while it is entirely true (in this sense) that Holmes ∈ {Holmes}, it is not entirely true that Holmes lived in London, though it is true. This gives locutions which corresponds well with what some of us do say.

Use of the entire / reduced contrast helps in resisting various unsavoury doctrines by which one might otherwise be more easily tempted. One of these is Parson's elaborate theory of relations (of Parsons 1974 and 1978) or rather for reducing many-place predicates to one-place by "plug-up" procedures. Another is the adverbial theory that would eliminate various many-place relations in favour of one-place predicates by devices such as hyphenation or concatenation. Thus too certain extensions of Characterisation Postulates that perhaps would otherwise be appealing lose their attraction.

8. *Further extending Characterisation Postulates*. In order to apply the theory of items satisfactorily, especially to philosophical puzzles and other problems presented normally in natural language, a still more generous class of characterisation postulates is wanted (as later chapters [in Vol. 2 *—Eds.*] will reveal). There are several ways of extending the postulates already given at competitively little cost. Some of these ways are desirable, some far from desirable. The main method consists in *enlarging the class of predicates*. There are various ways of doing this, some of which apply in natural languages. The more interesting cases are those where operations on predicates yield new predicates.

(a) The generation of further ch(aracterising) predicates by *concatenating* or neutralising, compound or relational predicates. Thus, for example, the concatenated predicate "is⌢ten⌢miles⌢south⌢of⌢Dunedin" obtained from the relational predicate "is ten miles south of Dunedin". The effect of concatenating is to bind up previously separate parts, and so render them inaccessible to logical operations, e.g. quantification of the term "Dunedin". Since a concatenated predicate is unitary and undissolvable into logical parts, it can be safely assumed reliable. For instance, the problem that reliability of the entire description "the city which is ten miles south of Dunedin" leads to, that it implies, what is false, that Dunedin has a city ten miles south of it, is blocked by the concatenated predicate for there is no separate term "Dunedin" that can be extracted as an independent subject. But while concatenated predicates avoid reliability problems they lead to others, such as the embarrassing questions What meaning do they have? How is the meaning related to that of the original unconcatenated predicate, etc.? Difficult questions, because such extensive concatenation does not occur in English for example.

Formal representation can be obtained by adding a concatenation operator $\frown$ on phrases to the logic. But while the introduction has a good point for other logical investigations (as Tarski showed for certain meta-logics), it has little as regards extending the power of CPs. More to the point is:

(b) the production of further predicates, some of them characterising, by *hyphenating*. Hyphenating differs from concatenating in that a hyphenated predicate, such as "is-ten-miles-south-of-Dunedin", includes terms that are not rendered inaccessible to logical operations such as quantification. What is ruled out is rearrangement, as in passive conversion. Thus hyphenating an entire predicate has the effect of reducing it. To represent hyphenating let us add to the logic a hyphenating operator h, applying to well-formed phrases (primarily to predicates). Then $h(\ )$, which is of the same syntactical type as $(\ )$, is the hyphenation of $(\ )$. Thus where a and b are words in sequence, $h(ab)$ is a-b. The logical properties of hyphenation are straightforward, e.g. it is associative but not commutative, $h(h(\ )) = h(\ )$, etc. Hyphenation affords an approximation to Parson's plugging-up procedures for predicates (already alluded to). However almost no use will be made of the operation in what follows.

(c) The generation of further ch predicates by *presentation*, or supposition, *operators*. For example, given the predicate f, the operation s yields the predicate $s(f)$ – also written sf – read "presents itself as f" or "says of itself that it fs" or "has supposititious f-ness". The first conditions on s are these: if $\sim\mathrm{ch}(f)$ then $\mathrm{ch}(sf)$; if $\mathrm{ch}(f)$ then $sf \approx f$. Hence $\vdash \mathrm{ch}(sf)$; $\vdash ssf \approx sf$. The "supposititious" terminology, adapted from Meinong, is thus somewhat misleading, since sf is presumably extensional. Such new ch predicates can be used at once in CPs such as HCP.

But more is expected of s operations. Consider t, where $t \approx \xi x(xf \ \& \ xg)$, e.g. "an existent round square", with $\mathrm{ch}(g)$ and $\sim\mathrm{ch}(f)$. Then an appropriate CP would yield the result that tsf and tg, e.g. an existent round square is round and square and presents itself as existing. The general principle (so far only very partially defined) is:

JCP. $sA(\xi xA)$, for every A for which sA is well-defined.

Given further clauses extending s component-wise to certain wff– such as $s(\underset{\sim}{t}f) \approx \underset{\sim}{t}sf$, $s(A \ \& \ B) \approx s(A) \ \& \ s(B)$ – it clearly follows that $tsf \ \& \ tg$. The relevant principle says not that an item which purports to be f purports to be f, but that an item which is f presents itself as f.

The operator s will be included in the logic because it enables a simple solution to be given to a small but vexing problem for any theory of objects (it is *also* a problem for rival theories, though it is an anomaly that has been shrugged offby the insensitive status quo). The problem is how is c, an existent round square, distinguished, or to be distinguished, from d, a round square? The answer is simply that c is sE while d is not. What is more c and d differ extensionally, i.e. $\sim(c = d)$.

JCP provides the sought replacement for the failed *GCP. *GCP was intended, among other things to accommodate partial reliability, and this JCP does, in a more satisfactory way (Since *GCP did not yield the distinction between c and d.)

Presentation operator s performs some of the tasks Meinong tried to achieve through his *depotenzierte* ("watering down") operator, which paradigmatically takes "which exists" to "existent" and more generally takes f to "substrength f". To what extent s approximates Meinong's operator, d say, is rather unclear and will be left unresolved. But one of the things Meinong noted, in effect as regards d, is worth considering for s. That is, where an object exists, the difference between sf and f vanishes, i.e tE & ext f $\dashv\!\exists$. $tsf \equiv tf$, and more generally

SA. $\underset{\sim}{t}E$ & ext $f^n \supset .\ \underset{\sim}{t}sf^n \equiv \underset{\sim}{t}f^n$, where $(t_1, \ldots, t_n)E =_{\mathrm{Df}} t_1E$ & $\ldots$ & t_nE.[1]

The converse of SA demonstrably fails. Existence is sufficient for the sort of reliability s-reduction marks but is far from necessary.[2] SA yields at once abstraction principles giving characterising features of existing objects, notably $(P\mathrm{ch}f)(U\underset{\sim}{t}E)$. $\underset{\sim}{t}f \equiv A$, with f not free in A, and forms of ECP, specifically $(\xi xA)E \supset A(\xi xA)$, where A is of weakly restricted form, but not necessarily constructed from ch predicates. For $A(x)$ is of the form xf_1 & $\ldots$ & xf_n (with each f_i any predicate, negated or not). By SA, $(\xi xA)E \supset .\ (\xi xA)sf_i \equiv (\xi xA)f_i$, for each i, whence $(\xi xA)E \supset .\ (\xi xA)sf_1$ & $\ldots$ & $(\xi xA)sf_n \equiv .\ (\xi xA)f_1$ & $\ldots$ & $(\xi xA)f_n$. But by JCP, $(\xi xA)sf_1$ & $\ldots$ & $(\xi xA)sf_n$, in virtue of the form of A. Hence $(\xi xA)E \supset .\ (\xi xA)f_1$ & $\ldots$ & $(\xi xA)f_n$; and so the result.[3]

[1] Axioms of this form are due to Parsons (see Parsons 1978), who exhibits their power. Note that s differs from Parsons' w operator not only in its setting in a different theory, but through axiomatic constraints such as JCP and in its intended interpretation.

[2] Restricted s-reduction corresponds to reliability; for $sA(\xi xA) \equiv A(\xi xA) \equiv .\ A$ is reliable. Existence is sufficient only in extensional cases. It may be that FCP should be similarly qualified.

[3] It is somewhat tempting to extend SA to

SAA. $\underset{\sim}{t}E \supset .\ sB(\underset{\sim}{t}) \equiv B(\underset{\sim}{t})$,

Much as the desired part of FCP was absorbed in HCP, so the positive JCP can be supplanted where it is well-defined by a principle which also, like HCP and unlike JCP, is negative in excluding predicates. An argument like that leading to HCP leads firstly to:

KCP. $(Px)(f)(xsf \equiv A)$, with x not free in A.

KCP implies HCP. For, given for some x, $(f)(xsf \equiv A)$, suppose ch$f$. Then $xsf \equiv xf$, whence HCP qualificationally. KCP is not however fully adequate for subsequent purposes or indeed for deriving JCP. Also needed is specification of a particular for which KCP does hold, as follows:

KCP′. $(f)(z_{\text{o}}sf \equiv A)$ where $z_{\text{o}} = \xi x(g)(xg \equiv A)$ and x is not free in A;

roughly, an object as such which is A is precisely sA. Then (given replacement principles) JCP results, much as FCP followed from HCP.

(d) The production of new predicates by the taking up of context, e.g. from the entire predicate "lived in London" results "lived in the London of the Holmes' stories", from "exists" results "exists in Shakespeare's England", etc. The method differs from the earlier systematic more syntactical methods, is hard to formalise, and will not be adopted. Some of what the method will achieve is better accomplished by subject transformation, e.g. of "the triangle", "the plane" etc., to "the Euclidean triangle", "the Euclidean plane", etc., of "England" to "Shakespeare's England" etc., which are sometimes important in ensuring such properties as truth and analyticity. (As to how such "duplicate" objects are defined, see chapter 7.8 [reprinted in Vol. 2 *—Eds.*]).

9. *Russell vs. Meinong yet again.* Russell's first argument against Meinong is defeated because (as thought traditionally) sentence negation cannot serve in characterisation.[1]

and so to derive ECP, since immediately $(\xi xA)E \supset .\ sA(\xi xA) \equiv A(\xi xA)$, and $sA(\xi xA)$ by extended JCP. This involves extending s to take wffinto wff, a move that has not been sufficiently investigated so far (there remain genuine worries as to the adequacy of SAA). Note that in general s cannot be extended componentwise, e.g. $s((Pf)B)$ cannot be equated with $(Pf)sB$.

[1] In the consistent theory. In the appealing paraconsistent alternative, Russell's first argument simply vanishes. Who would expect a contradictory object to be other than contradictory? (See further chapter 5 [reprinted in Vol. 2 *—Eds.*]).

Russell's second argument[1] is defeated, in the first instance, because "exists" is not a characterising predicate. And rightly. For duly restricted Characterisation Principles should not guarantee $(Px)xE$, something exists, as a matter of logic. Contrary to *a priori* theology and classical mathematics, the existence of an item should not be provable simply by logical means. Thus the theory of items escapes Russell's Ontological Argument against Meinong, in *a* way recommended by Meinong. That way is a way Meinong was (perhaps reluctantly) forced to pursue in the case of full-strength existence, namely through Kant's thesis that existence is not a characterising property. There is a good Meinongian case for this approach, and for Meinong's eventual restriction (in Mög) of UCP to predicates of so-being (cf. Findlay 1963, p. 105). For the pure object, according to Meinong, is indifferent to and stands beyond both being and non-being; these distinctions are introduced from outside, they are external. Whether an object is or not makes no difference to *what* an object is, to its so-being, how-being or what-being. What the object is, its real essence, consists in a number of determinations of so-being, and such determinations are possessed by the object whether or not it exists. Being or not being have nothing to do with the object as object, though in some cases the so-being of an object implies its non-being. Consequently we cannot make existence, or any other sort of being, part of the *nature* of a Meinongian object, or include it in characterisation principles (see further chapter 12.2 [reprinted in Vol. 3 *—Eds.*]).

However Meinong was dissatisfied with such a simple answer. As is well-known, he tried to evade Russell's conclusion by what looks like, and has been seized upon as, a classic piece of theory-saving – by saying that the existent round square is existent but that it does not exist because it lacks the modal moment. Russell denied that he could find a difference between "is existent" and "exists", and certainly the modal moment doctrine is neither especially perspicuous nor as usually explained very convincing. It is obscure whether weak existence is an existence notion, how the modal moment lifts weak existence to full-strength existence; and it is unclear why Russell's ontological argument cannot be immediately re-presented using full-strength existence. Meinong's reason for treating weak existence as part of the so-being of an object *seemed* to be that he wanted to allow not just that one can assume anything one likes, but that the assumed item really

[1] To be precise, the second argument did not touch Meinong, but only Meinong and his students as holding a common doctrine. All Meinong strictly offered were some cases of a CP: it was Ameseder who threw in the predicate "exists". And then Russell could argue that as the round square is round, so presumably the existent round square is existent, i.e. exists.

has all the supposed features. The latter thesis has to be given up, but it is separable from the former. Of course one can suppose anything one likes, only it won't always (consistently) possess all the supposed features.

There is nonetheless a real point to Meinong's dissatisfaction, which is that the simple answer, on its own, leaves no way of separating the existent round square from the intuitively distinct round square. To effect the separation something *like* Meinong's substrength operation s seems to be essential. Hence the introduction of operation d and the more elaborate JCP to effect the distinction in the theory of items. But with this apparatus there is no call to try to force a distinction between between "existent" and "which exists"; for Russell's second argument is defeated as before, namely "which exists", like "exists", is not characterising.

10. *Strategic differences between classical logic and the alternative logic canvassed*. The approach to assumption and to characterisation postulates illustrates the general difference in approach and strategy between the alternative logic being designed and classical logic and its extensions. The approach is to admit anything for consideration, to maximize expressibility, to follow natural discourse in its liberality as regards what can be expressed, in contrast to classical approaches, which aim to severely regiment language, and which drastically restrict what can be said. Simple and familiar examples of heavy-handed classical methods are the levels of language theory, type theory and its variants, the exclusion or curtailment of a range of natural language predicates beginning with "exists" and in some cases including much of intensional discourse. The strategy of maximizing expressibility (with minimum mutilation or reductive analysis) means maximizing what goes into the logic, which parts of discourse the logic can accommodate, and attempting to formulate or impose restrictions explicitly in the logic itself as conditions on logical behaviour, in contrast to the classical logical procedure of operating with and relying heavily upon extra-logical restrictions which greatly limit the range of discourse, e.g. subject terms and predicates admitted to logical treatment.

There are several objections to the classical approach. The restrictions are commonly vastly over-restrictive, they cut out far more logically than is necessary or desirable, as slight adjustments to the logic make plain, and they greatly and unnecessarily reduce expressibility. For example, in order to achieve a limited restriction an entire class of predicates is rejected. Moreover because the restrictions are prelogical and not sharply

formulated, the real reasons for restrictions are frequently not examined and instead pseudo-explanations are offered. For illustration consider the classical logical treatment of the Ontological Argument, and the alleged discovery (after Kant) that existence is not a predicate. What is wrong with the Ontological Argument is said to be that it treats existence as a predicate, whereas in fact existence is not a proper, or logical, predicate. This is a pseudo-explanation; for the admission of existence as a predicate by no means guarantees the validity of the Ontological Argument or its variants; so the exclusion of existence as a predicate cannot be what is wrong with the Argument. Classical logic has not in fact produced a satisfactory explanation of what is wrong with the Ontological Argument. It is prohibited from doing so by its refusal to admit existence: it can not look through or into the argument formally: its restriction prevents it from getting to the bottom of what is wrong with the argument. It has been content with imposing an arbitrary extralogical restriction on the class of admissible predicates, which throws out good arguments along with bad and does not face the issue of how to distinguish between them, and therefore of providing a genuine explanation (cf. cutting offa head to stop a headache, the method of classical levels and type theories).

What has to be assured to obtain an Ontological Argument is not that existence is a predicate but that it is an invariably reliable, or characterising, predicate.[1] It is this assumption and not the first that is objectionable. An object cannot successfully determine just in virtue of its description its own ontic properties, for example its existence or its possibility. Existence and possibility are on all fours in this regard, and existence is simply one member of a class of predicates which are not invariably reliable. If objects could determine their own ontic status, they would be able to determine by pure postulation features which cannot be determined in this way, and which are independent of postulation, e.g. whether or not something exists. This explanation ties in already with one's intuitive feelings about the Ontological Argument, that if it were correct items could be conjured into existence by their own characterisations or definitions, things could be determined which are not open to determination by postulation (or definition), because they are already independently settled by features of the actual world. The solution is not to legislate to stop all logical conjuring tricks: it is rather a matter of seeing what the conjurors are doing, finding out how the tricks are done, and not accepting everything

[1] The same applies to properties that imply existence, such as the perfection property used in the traditional Ontological Argument.

they do at face value. The Ontological Argument is a conjuring trick, it lifts an object from *Aussersein* to existence, but the response of classical logic on realising that it has been tricked is to outlaw all conjuring; a more sensible response would be to try and work out how conjurors perform the trick, and why it is a trick, and remember not to be gulled in the future.

If the alternative logic maximizes expressibility, how does it avoid paradox, unwanted inconsistency and collapse? As the discussion of the Ontological Argument begins to reveal, by not taking all tricks and assumptions as given, all presentations as reliable. The approach is logico-phenomenological certainly: all logical phenomena are admitted and studied for what they are and as far as can be without distortion or subjection to preassigned and quite possibly defective moulds, positions and logical structures; but the approach is also alive to, and makes due allowance for, items which represent themselves as possessing features which they do not have.

11. *The contrast extended to theoretical linguistics*. Though modern linguistics takes much fuller account of the linguistic data than philosophy, including "ordinary language" philosophy, ever did, most of theoretical linguistics is still highly reductionist and referential in character. The classical logicians' picture of natural language as at best decidedly systematically misleading (and at worst totally incoherent) and in need of replacement by a refined canonical language involving only clear and distinct notions (e.g. referential ones) is transposed in theoretical linguistics into a contrast between natural language which is irregular, seriously incomplete, and full of ambiguity, and in need of analysis in terms of a deep structure which is unambiguous and appropriately complete (distinct and clear), and almost invariably referential. The two parallel reduction programmes, that to a canonical logical language and that to deep structure have been combined by the conjecture – rather obvious once the parallel has been discerned, and the connection between logical transformations and "grammatical" transformations noticed – that deep structure just is canonical logical form. In its most simple-minded, and conspicuously inadequate, form the conjecture has been that deep structure is provided by classical quantification logic; a less inadequate proposal is that the logic involved is a λ-categorical logic.

The parallel has meant that, and is reflected in the fact that, linguists are often working over the same ground, and with the same mistaken referential commitments, that philosophers have worked over before, e.g. in such areas as reference, presupposition,

contextial implication; and that recent linguistic "discoveries" parallel older philosophical "findings".

The noneist theme is that just as an analysis of natural language into canonical logical form is not required – it is not disputed that the procedure can have its illuminating aspects, along with its damaging ones – so an analysis into deep structure is not required.

Just as the logical reduction has been forced by a mistaken theory, the Reference Theory, so the location of ambiguities, which are said to require resolution in a deeper structure, is very often the product of applying the same referential assumptions. Just as logic functions, on the noneist picture, not as a superior replacement for actual language, but as an addition to it, as extension of it, so linguistic analysis becomes a superstructure built on natural language which does not require reduction to a "deeper" canonical form. The fact that a canonical form cannot cater for surface structure commonly shows, not the unsatisfactoriness of the surface form, but the inadequacy of the canonical forms.

§22. Descriptions, especially definite and indefinite descriptions.

Although the emphasis will be upon [certain] singular descriptions, as opposed for instance to plural descriptions, it is easy to say something of worthwhile generality about all descriptions.

1. *General descriptions and descriptions generally.* A descriptor τ is an operator which combines with variables and wffto yield a subject term, binding the given variables in the process; the result, e.g. $\tau x_1 \ldots x_m(C_1, \ldots, C_n)$, is a description, with $x_1 \ldots x_m$ bound variables.[1] The insertion of variables in the course of formally paraphrasing natural language descriptions enables elaborate cross-referencing to be tracked and descriptions to be readily linked to, and sometimes eliminated by, quantified expressions; but the main reason for the introduction of variables is to facilitate quantificational paraphrase. Natural language descriptors typically apply to general terms, and quantificational theory can only approximate general terms by way of predicate transformation and variabilisation. To be more explicit: general terms are formally paraphrased, usually, in terms of variables concatenated with a predicate transformation of the term; m[an] is replaced by "x is (a) m[an]", xm for short. Thus too the need for introduction of a variable with a

[1] Full logistic accounts of generalised descriptors and quantifiers are given in Slog, chapter 3.

simple description such as "the" and the requirement that "the" serves to bind the variables; for "the m[an]" is transformed to "the xm[an]" which makes no sense without the insertion of "x(such that)".

English descriptors include not just the definite descriptor ("the") and the usual indefinite descriptor ("a"), but also such descriptors as "a certain", "an arbitrary", "any" and "each". They include, in addition, what are nowadays formally paraphrased as quantifiers, "every", "all", "most", "many", "some", "no". For in each case these operators applied to general terms yield subjects, often plural subjects but sometimes singular subjects. For example, "every man" is a (complex) subject in English, not a sentence. It is not so easy to isolate a slick criterion which determines just which English descriptors are, or should be, formally displaced by quantifiers; indeed it is commonly supposed that none need be sought since all descriptors should be so displaced. If the subjects admitted in quantificational logic are restricted to singular subjects, as they usually are (plural subjects causing some trouble), then several English descriptors, including many of those expressed as quantifiers, are excluded, e.g. all, most, many. Since it is commonly assumed that other quantifiers, such as the invariably singular "every", "each" and "any", and the variable (sometimes singular and sometimes plural) "some" and "no", can be defined in terms of the invariably plural forms, the nonsingular test provides an initial demarcation line (initial, because classical theory shows that classical definite and indefinite descriptors can also be eliminated in favour of quantifiers).

The Quine–Geach thesis is that *all* English descriptors can be adequately paraphrased quantificationally, using classical quantifiers. That thesis is false, as the discussion of definite descriptions in part III above [i.e. §§8–14 *—Eds.*] reveals "the" for example, cannot be so eliminated preserving truth. The extent of the failure of the Quine–Geach thesis has been well-illustrated by Vendler 1962, who reveals the complexities of the descriptors "each", "all", "every" and "any" – complexities to which *classical* quantificational paraphrases fail to do much justice. Vendler, however, overstates his case: he proceeds to a conclusion which his examples in no way support, namely that formal logic is unable to account for the behaviour of natural language quantification. This is to suppose, quite erroneously, that formal logic is exhausted by classical quantificational theory, and that the paraphrases of descriptive expressions into quantification logic that have been assembled by Quine and Geach (most of them derive from Russell and others) exhaust the options for formal logic. On the contrary, formal logic is *far* from exhausted

by classical quantification theory and straightforward extensions. Other logical frameworks such as combinatory logic and Church's type theory (of Church 1940), offer rather different ways of paraphrasing descriptive expressions. The methods these alternatives lead to (explained in §24) are su ffi ciently general to enable accurate paraphrase of any exact theory of descriptors, including a tightening-up of Vendler's proposals. And even within the classical quantificational scheme of things, there are important alternatives to quantificational paraphrase of descriptive expressions, e.g. uneliminable descriptive phrases can be simply admitted,[1] or descriptors can be treated as binary functors (as in SE).

Even if formal logic does have ways of paraphrasing any descriptor that satisfies a set of axiomatic conditions (as §24 explains), in the case of most natural language descriptors it is obscure what axiomatic conditions govern the logical behaviour of the descriptors, and whether general conditions can be found which serve to characterise one descriptor as opposed to another. In short, the logic of most natural language descriptors remains somewhat opaque. The discerning of the logic of most of the descriptors is not, however, a problem peculiar to noneism, nor is it of immediate importance. For leading noneist theses can be satisfactorily stated and investigated using just the quantifiers already introduced, and but a few simple descriptors. In this section the descriptor that has received most study, the definite article, "the", gets prime consideration; but two forms of the indefinite article "a" will also be studied, "a (definite)" and "an (arbitrary)". But many of the general points about descriptors apply also to other descriptors.

2. *The basic context-invariant account of definite descriptions*. Since descriptions are not incomplete symbols, descriptions need not be defined just in contexts. Descriptions can be admitted as full logical subjects, on a level with proper names and subject variables. As the interpretation in no way depends upon a distinction between (logically) proper names and descriptions it would be perfectly proper to introduce $\imath$ as a primitive symbol, and to add appropriate postulates for descriptions. This course, which will eventually be adopted, is not necessary for initial purposes, which aim at obtaining noneist replacements

[1] A general theory of descriptive operators in quantificational logic has been worked out by several researchers independently. A readily accessible presentation is in the final chapters of Kalish and Montague 1964. The "general" theory has however a serious flaw, namely the extensionality assumption that classical theory tends to force for want of more stringent equivalence relations, e.g. in the case of a simple descriptor τ: $A \equiv B \supset .\ \tau\, xA{=}\, \tau xB$, or (a minor improvement) the strict form: $A \equiv B \dashv \tau xA = \tau xB$. Such extensionality principles for the definite descriptor have already been criticised in §14 in the examination of Scott's theory. The objections generalise to other descriptions.

for classical and free description theory, that is to say, theories in which uniqueness is assessed absolutely and not contextually (cf. §11). Since choice descriptions have been introduced as primitive, definite descriptions may be defined in terms of ξ, thus:

D$\imath$. $\quad \imath uA(u) =_{\mathrm{Df}} \xi uA!u,$

where $A!u$ reads "u satisfies A uniquely". The problem is how to specify uniqueness in the vast domain of objects. First attempts simply add to A an absolute (i.e. context-invariant) uniqueness clause, as follows:

D$\imath$1. $\quad \imath uA(u) =_{\mathrm{Df}} \xi u(A(u) \,\&\, (Uv)(A(v) \supset .\ vIu)),$

i.e. $\imath uA(u)$ is defined as $\xi!uA(u)$, where I is some identity determinate governing the uniqueness determinate. That is, *the u which satisfies A is an (arbitrary) unique u which satisfies A*; the f is a unique f. The theory thus accords with – indeed, apart from the use of ξ, scarcely adds to – Russell's remark (in MP) that "the only thing that distinguishes 'the so-and-so' from 'a so-and-so' is the implication of uniqueness". More generally, then, *"the" is a determinable characterised in terms of the other determinables* "a" and "unique", *as "a unique"*. In the context-invariant case the uniqueness determinable is in turn characterised in terms of the determinables "every", "if" and "is (identical with)", i.e. $A!u$ is defined thus:

$A!u =_{\mathrm{Df}} A(u)$ & (every v)(if $A(u)$ then v is identical with u).

The uniqueness determinate selected classically is, as should be expected, thoroughly referential. It amounts to uniqueness in world $\underline{\underline{G}}$ where everything exists and is splendidly extensional. No nonexistent Eiffel Towers, with different heights or of different materials from the actual horror, interfere with the existentially unique one. But the classical referential uniqueness determinate is not adequate even in existential cases (as we shall see); it is even more unsatisfactory neutrally. Nonetheless it is worth working with an analogue for a while.

It is perhaps surprising, given the incompatibility of the theory presented with Russell's theory, how many of Russell's remarks about definite descriptions (in MP, p. 21ff.) are vindicated by the theory. For the theory of descriptions which emerges differs

substantially from Russell's theory. In particular, these results follow *without qualification* from logical properties of ξ: as in free logic, $\vdash \imath v A(v)\ I\ \imath v A(v)$, i.e., as in free description theory, identity is fully reflexive; but unlike free logic, $\vdash (Uu)B(u) \multimap B(\imath v A(v)/a)$, i.e. definite descriptions are full subject terms and can *always* replace or instantiate variables (given only an initial rewrite of bound variables).

The theory of descriptions, which applies in principle to any sort of objects, particular, propositional or attribute, consists, so far then, of two parts: first, *a* theory of indefinite descriptions in terms of a choice descriptor ξ (the theory will shortly be enlarged to include other sorts of indefinite description that occur in natural language); and secondly, based on this, a theory of definite descriptions. The main application of the theory will be to bottom order objects, to particulars – objects that are characteristically separated from intensional higher order objects through the identity conditions they meet. For bottom order objects the appropriate identity determinable is extensional identity, and, correspondingly, the appropriate context-invariant uniqueness condition is extensional uniqueness. Hence the initial working definition, within quantification theory interpreted over bottom order objects (as it commonly is, but certainly doesn't have to be), namely:

D$\imath$2. $\quad \imath x A =_{\mathrm{Df}} \xi y(A\ \&\ (z)(A \supset .\ z = y))$.

Almost all of what follows will be set within the same quantificational framework, i.e. the theory is essentially first-order in form though it admits of higher order application to higher order objects, where it connects with the λ-theory. In pure modalised second-order theory, the appropriate identity determinable for attributes is strict identity, or what comes to the same in that restrictive setting, Leibnitz identity, i.e.

$\imath f A = \xi g(h)(A \equiv .\ h \equiv g)$.[1]

The theory of descriptions, in terms of selection of objects, combines well with the account given of proper names (outlined at the end of §14). It thus satisfies the requirement (of §14) that there is no sharp boundary between names and descriptions: they receive an overlapping logical role. Furthermore the theory given satisfies conditions

[1] Should the biconditional also be increased to strict strength? Very likely. In more adequate settings the minimal determinable for attribute identity is coentailment.

(ai)–(aiii) of §12 (p. 169). Descriptions are not incomplete symbols, each has an independent meaning, in particular *each signifies something*. For qu($\imath xA$)Des $y \equiv .\ \imath xA = y$ and $\Box(Py)(\imath xA = y)$. It may be objected that the theory specifies too much, that when uniqueness or particularisation conditions fail, designations are undefined or should be defined differently from the rather arbitrary way the theory assigns them. Some of these problematic assignments are forced by the context-invariant character of the uniqueness requirement. The wrong assignments will tend to be made on any theory that does not take due account of context. But some are enforced by the interpretation of ξ, which assigns arbitrarily when its condition is not satisfied. There are two questions here: should it assign at all in such cases, and it if should, should it assign in a less arbitrary fashion. Needless to say, theories can be devised which adopt (perhaps different) epsilon operators which do not make assignments or which assign differently. As usual, choice among the different theories or interpretations is not a matter of convention or convenience, as the pragmatically inclined would have. The no-assignment choice is a poor one because it sacrifices needlessly the important intensionality thesis that every (meaningful) term signifies an object (at least of thought); and it leads immediately to difficulties for the assessments of descriptions in larger intensional sentence frames. For example, if no assignment is made to "the author of PM" then it is awkward accounting for the truth of "Bleerbhotham believed that the author of PM wrote several other books". Similar examples reveal that a purely arbitrary choice of object when the condition fails is less than satisfactory. An appropriate choice (which can be accommodated in ξ theory) would still select $\imath xA$ from $\{x : A(x)\}$ in the case of uniqueness failure, and would thus assign "the author of PM wrote several other books" value true, rather than false or (what the logical theory does not so far allow for) unassigned. Assigning the value true does not, however, rule out the correction: What you said is inaccurate; PM had two authors, each of whom wrote several other works.

There is moreover a serious objection to the use of arbitrary assignments for ξ-terms when the conditions are not satisfied, namely that the uniqueness condition given will very frequently fail, certainly with nonentities. For consider, e.g., the round square, rs $\approx \imath x(xr \ \& \ xs)$. It is not unique among round squares, for there are, by FCP, green round squares and blue round squares, and so on, and they are extensionally distinct from the round square. Since the green round square $\neq$ rs, but the green round square is

round and square, it is false that for every z, if zr & zs then $z = \text{rs}$.[1] The problem is, in accentuated form, the problem already observed in classical and free description theories, the problem of the nonuniqueness of "the red-headed man" (considered on p. 182). The problem is resolved below by way of contextual restrictions, on A. For the present – to achieve comparisons with classical theories – a classical-style escape may be tolerated: in the damaging application A is incompletely formulated and should have included further riders, e.g. it should add to zr and zs something like "and z is among things indicated thus . . . ".

Someone rightly dissatisfied with such an "escape" may argue that selection among round squares is forced with the failure of uniqueness if the initial (classically modeled) definition is not to yield wrong results. But if such an interpretational requirement *is* imposed then $\imath xA$ behaves logically precisely like ξxA. For it too selects an x such that A uniquely if there is one such and an x such that A otherwise. In short, the initial definition, more satisfactorily interpreted, collapses back into a neutral (and intensional) version of Church's theory of definite descriptions (of Church 1940). On this account "the" differs from "an arbitrary" only by a contextual increment, a difference that is not reflected (so far) in the logic; that is, context excluded:

D$\imath$3. $\quad \imath xA =_{\text{Df}} \xi xA.$

One might try to get away with D$\imath$3 on some such grounds (or pretext) as that a *full* theory of descriptions is not strictly needed, any more than a theory of proper names: In logic at least only so much is needed, the rest, such as additional contextual features, can be left undefined or open. But though D$\imath$3 would make for considerable economies (e.g. in CPs), and does offer a general theory which includes both pure and ordinary objects (as explained in 7 below), our sights are set on much more than narrowly logical goals.

3. *A comparison with Russell's theory of definite descriptions*. Russell's theory of definite

[1] But of course there is a determinate in terms of which the (pure) round square is unique: it is – unlike *a* round square – the only object that is *just* round and square, that is it has no other properties. But making this simple proposal formally good is not entirely straightforward (and it too omits context). The (pure) round square can be defined thus:
$\imath x(xr \,\&\, xs) = \xi x(xr \,\&\, xs \,\&\, (z)(zr \,\&\, zs \,\&\, (\text{ext}\, f)(zf \supset .\ f \approx r \vee f \approx s) \supset .\ z = x))$;
and one way of generalising the definition is as follows:
$\imath xA(x) =_{\text{Df}} \xi x(A(x) \,\&\, (z)(A(z) \,\&\, (\text{ext}\, f)(zf \supset .\ A(w) \supset_w wf) \supset .\ z = x))$.
We shall return to such pure objects subsequently.

descriptions consists – in the simplified form of MP, where scope is largely neglected – of two definitions:

(α) A definition of $(\imath x x g)E$, such that logically $(\imath x x g)E \equiv (\exists y)(yg \,\&\, (\forall z)(zg \supset .\ z = y))$

(β) The following definition of $(\imath x x g)f$: (i) there exists an item which is g, and (ii) anything which is g coincides with that item, and (iii) that item is f.

As already explained (in §§12–13), an initial weakness of this theory is that it requires *two* definitions, and that no provision is made for ontic predicates other than "E", such as "$\Diamond$". Another defect of the theory is that in (α) "$\imath$" should carry no existential loading, whereas in (β) "$\imath$" must carry existential loading for the first clause of Russell's analysis to be cogent. Furthermore some restrictions on the class of f for which (β) holds must be imposed: it is, for instance, quite unsatisfactory to instantiate f by an ontological predicate such as $\sim E$ or $\Diamond$. Consider the consequences of assigning "$\sim E$" for "f" in (β). Since $\vdash \sim(\exists x)x{\sim}E$, it would follow $\vdash \sim(\imath x x g)E$, *whatever* property g may be, contradicting (α). In fact a drastic restriction on the class of f for which (β) holds is needed, as counterexamples (of §12) demonstrate: even when scope is duly allowed for, many intensional predicates must be excluded. Thus not both (α) and (β) can be expected to hold without qualification. Not both do hold, since together they imply the mistaken $(\imath x x f)E \equiv (\imath x x f)f$ (PM, *14.22). And not both can hold since Russell's theory is inconsistent with the unrestricted theorems $\vdash (Ux)xf \supset (\imath x x g)f$, $\vdash \imath x x g \approx \imath x x g$ (whichever definition of $\imath$ is adopted).

But *both the fundamental definitions of Russell's theory (α) and (β)* do *reappear in modified forms, which* incidentally *provide correct conditions on the truth of (α) and (β).* In place of (α) the following result is derivable (among others: for there are other analogues than that using D$\imath$2):

$\vdash (\imath x x g)E \leftrightarrows (\exists y)(yg \,\&\, (Uz)(zg \supset .\ z = y))$.

(Proof over page.)

1. RHS $\dashv\vdash$ $(Py)(yg \,\&\, (Uz)(zg \supset .\ z = y) \,\&\, yE)$
   $\dashv\vdash .\ (\xi yA(y))g \,\&\, (Uz)(zg \supset .\ z = \xi yA(y)) \,\&\, (\xi yA(y))E$, where
   $A(y) \approx .\ yg \,\&\, (Uz)(zg \supset .\ z = y) \,\&\, yE$. Thus
   RHS $\dashv\vdash .\ [(\imath xxg)g \supset .\ \imath xxg = \xi yA(y)] \,\&\, (\xi yA(y))E$.

Also

   RHS $\dashv\vdash .\ (Py)(yg \,\&\, (Uz)(zg \supset .\ z = y)$
   $\dashv\vdash$ $(\imath xxg)g$. Hence
   RHS $\dashv\vdash .\ [\imath xxg = \xi yA(y)] \,\&\, (\xi yA(y))E$
   $\dashv\vdash .\ (\imath xxg)E$, since $\vdash E$ ref .

2. LHS $\dashv\vdash$ $\xi x(xg \,\&\, (Uy)(yg \supset .\ y = x))E$, i.e. $(\xi xB(x))E$. But
   $\vdash \xi xB(x)E \dashv\vdash B(\xi xB(x))$, by ECP. Hence,
   LHS $\dashv\vdash$ $(\xi xB(x))g \,\&\, (Uz)(zg \supset .\ z = \xi xB(x)) \,\&\, \xi xB(x)E$
   $\dashv\vdash$ $(Py)(yg \,\&\, (Uz)(zg \supset .\ z = y) \,\&\, yE)$
   $\dashv\vdash$ $(\exists y)(yg \,\&\, (Uz)(zg \supset .\ z = y))$.

Turning to (β), an analogue of (βiii), $\vdash (\imath xxg)f \dashv\vdash (Px)xf$, is immediate. As the x that has g may not exist, since descriptions cannot be relied upon to carry existential commitment, (βi) does not follow from $(\imath xxg)f$. However (βi) does follow where the description is existentially-loaded, under the proviso that the item in question is reliable. Thus two cases are examined, first where the description does not carry existential loading, and second where it does.

First case: $\vdash (\imath xxg)f \supset .\ (Py)(yg \,\&\, (Uz)(zg \supset .\ z = y) \,\&\, yf)$, provided $(\imath xxg)$ass [where "ass" is the assumptibility predicate, cf. §5 *—Eds.*]. Since $\imath xxg$ is definitionally $\xi!xxg$, i.e. of the form $\xi xB(x)$, $(\imath xxg)$ass $\dashv\vdash B(\xi xB(x))$, i.e. $(\imath xxg)$ass $\dashv\vdash .\ (\imath xxg)g \,\&\, (Uy)(yg \supset .\ y = \imath xxg)$. So, provided $(\imath xxg)$ass, $(\imath xxg)f \supset .\ (\imath xxg)g \,\&\, (Uy)(yg \supset .\ y = \imath xxg) \,\&\, (\imath xxg)f$, whence the result. $\vdash (Py)(yg \,\&\, (Uz)(zg \supset .\ x = y) \,\&\, yf) \supset .\ (\imath xxg)f$, provided f ref. The proof is similar to that given under (α), upon replacement of "E" in that proof by "f". Combining these results $\vdash (\imath xxg)f \equiv .\ (Py)(yg \,\&\, (z)(zg \supset .\ z = y) \,\&\, yf)$, provided $(\imath xxg)$ass & f ref, and hence provided $(\imath xxg)$ass & f ext. The extension-

ality qualification may be removed by replacing extensional identity by Leibnitz identity throughout, by assuming the identity logic of PM. The assumptibility qualification may be weakened, to the provision $(\imath xxg)f \supset (\imath xxg)\text{ass}$. This provision too is in the spirit of PM; for $(\imath xxg)f \supset (\imath xxg)E$, by the Ontological Assumption, and $(\imath xxg)E \supset (\imath xxg)\text{ass}$, by the assumption of existence-controlled reliability.

Second case: There are two ways in which an existentially loaded descriptor may be defined in the framework given. Firstly, an intermediate descriptor II which requires existential loading but does not demand existential uniqueness may also be defined, thus: $\text{II}xA(x) =_{\text{Df}} \imath x(xE \ \& \ A(x))$. In terms of this descriptor, $\vdash (\text{II}xxg)f \equiv (\exists y)(yg \ \& \ (Uz)(zg \supset .\ z = y) \ \& \ yf)$, provided $(\text{II}xxg)\text{ass} \ \& \ f\,\text{ref}$. For

$$\begin{aligned}(\text{II}xxg)f &\equiv \imath x(xg \ \& \ xE)f \\ &\equiv (Py)(yE \ \& \ yg \ \& \ (z)(zE \supset .\ zg \supset .\ x = y) \ \& \ yf) \quad \{\equiv \text{RHS}\},\end{aligned}$$

under the provisos. Thus the intended form of (β) results, subject to two interesting qualifications. But the descriptor II has little more than formal interest, since anyone who really wants to insist upon existential loading will also insist upon existential uniqueness, i.e. uniqueness among existing objects. So results the existential definite descriptor I_{L}, defined, using Leibnitz identity: $I_{\text{L}}xA(x) =_{\text{Df}} \xi x((\forall z)(A(z) \equiv .\ z \approx x))$. Other identity determinates are almost always more appropriate, but I_{L} makes the comparison with Russell's theory easier. For then $\vdash (I_{\text{L}}xxy)f \leftrightarrows (\exists z)(zg \ \& \ (\forall y)(yg \supset .\ y \approx z) \ \& \ zf)$, provided only $(I_{\text{L}}xxg)\text{ass}$. A similar second analogue of (α) can be obtained, namely in the result $\vdash (I_{\text{L}}xxy)E \leftrightarrows (\exists y)(yg \ \& \ (\forall z)(zg \supset .\ z \approx y))$, without provisions. The assumption under which (β) is established, viz. $(I_{\text{L}}xxg)\text{ass}$ is however a large one, which frequently enough would be wrong. It is best avoided. It is in fact a product of the excessive existential requirements incorporated in Russellian theory and can be escaped in theories which (rightly) demand less. The proper comparison of neutral description theory is really not with classical description theory, but with free description theory where the erroneous existence (and identity) assumptions of classical theory have been to some extent removed.

4. *Derivation of minimal free description logic and of qualified Carnap schemes*. Deriving minimal free description theory is primarily a matter of deriving the basic scheme for free

descriptor I, namely:

FDL. $(\forall y)(y = IxA \equiv .\ A(y)\ \&\ (\forall z)(A(z) \supset .\ z = y))$.

The only art in deriving FDL lies in choosing an appropriate definition of descriptor I. But in fact the considerations of §14 guide the choice of definition completely. For we already know that $IxA(x)$, understood as "*the* x such that $A(x)$" will have a definition of the form: *a unique* x such that $A(x)$; and we know that in free logic (where a guiding principle has been Quine's: to be is to be the value of a bound variable) all bound variables are existentially-loaded, and that the uniqueness requirement is one of existential uniqueness (see the discussion of "the red-headed man" in §14). Accordingly, as before

$IxA(x) =_{\mathrm{Df}} \xi x(xE\ \&\ A(x)\ \&\ (\forall z)(A(z) \supset .\ z = x))$.

The existentially-loaded descriptor I may be read "the existent" or "the actual". There is one remaining indeterminacy to settle before FDL is derived, namely what identity determinate is involved in FDL and in the definition of I: is it Leibnitz identity or extensional identity? In fact early free logic almost invariably adopted Leibnitz identity, but some more recent theories have toyed with use of extensional identity. It costs little to consider both cases:

a. *The identity determinate is Leibnitz-identity* $\approx$. There are two cases in proving the biconditional FDL.

Case 1. Suppose yE and $y \approx IxA$: To show $(\forall z)(A(z) \equiv .\ z \approx y)$. By identity principles, $(IxA)E$. Hence, by ECP, $A(IxA)$, whence expanding using the definition of I, $(\forall z)(A(z) \supset .\ z \approx IxA)$. Hence as $y \approx IxA$, $A(y)\ \&\ (\forall z)(A(z) \supset .\ z \approx IxA)$.

Case 2. Suppose $yE\ \&\ A(y)\ \&\ (\forall z)(A(z) \supset .\ z \approx y)$: abbreviate this wffas $C(y)$. By the ξ-scheme, $C(\xi yC)$ (subject to usual variable provisos), i.e. $C(IyA)$. Hence, expanding the scheme, $(IyA)E\ \&\ A(IyA)$. By the last conjunct of the hypothesis, $(IyA)E\ \&\ A(IyA) \supset .\ IyA \approx y$. Hence, detaching, $y \approx IxA$, as required.

b. *The identity determinate is extensional identity*. Case 2 is as before, but case 1 is modified. Firstly, the step from yE and $y = IxA$ to $(IxA)E$ uses the transparency of E.

Secondly, and more important, the step to $A(y)$ from $A(IxA)$ and $y = IxA$ requires that $A(x)$ be extensional. Thus FDL becomes subject to the proviso that $A(x)$ *be extensional*.

The underlying free logic, free quantification logic with identity, follows as before in neutral theory; and $IxA(x)$ is a well-behaved term where $A(x)$ is a free wff. For, in particular, $\vdash (IxA(x))E \supset .\ (\forall y)B \supset B(IxA(x)/y)$. [cf. also PM, *14.18].

Qualified versions of Carnap's core scheme for theories of descriptors follow using FDL, as in §14. In particular, where identity is Leibnitzian, if $(IxA)E$, then $B(IxA) \equiv (\exists y)[(\forall x)(A(x) \equiv x \approx y)\ \&\ B(y)]$. A similar scheme holds where the identity determinate is extensional, subject however to the proviso that A and B are extensional.

5. *An initial comparison with Russell's theory of indefinite descriptions*. Russell's theory of indefinite descriptions, of the article "an" can likewise be taken to consist of two theses, in this case

(γ) An item which is g exists iffthere exists something which is g; what can be represented neutrally as $(\xi xxg)E \equiv .\ (\exists x)xg$.

(δ) An (actual) x which is g is f iffthere exists an item which is g and f, what can be represented neutrally as $(\xi xxg)f \equiv (Px)(xg\ \&\ xf)$, or better, in existentially-loaded form, as $(\epsilon xxg)f \equiv (\exists x)(xg\ \&\ xf)$.

The thesis makes it plain, first of all, that "an" is being construed as "some or other" or (differently) "an arbitrary", not as "a certain" or "an already selected". For in the latter case that there exists a g would not guarantee that the certain or select g does, only some other may. The appropriate descriptor to consider then in this comparison is a descriptor that behaves logically like ξ (or versions of it, such as existentially-loaded versions). The symbolism adopted reveals that there is room for the same sort of vacillation between existentially-loaded and existence-free indefinite descriptions as occurs in the case of definite descriptions. Attempts to rationalize the matter by using ξ uniformly founder. For then though one half of (γ) derivable and correct, (δ) $(\xi xxg)f \equiv (Px)(xf\ \&\ xg)$,[1] is false. On the other hand, should we endeavour to use ϵ uniformly, then though $(\gamma')(\epsilon xxg)E \equiv .\ (\exists x)xg$ is correct, (δ') is only provisionally correct. But the attempts indicate, what other evidence confirms, that the loaded descriptions are the classically intended ones: they are commonly not the ordinarily intended ones, as we have seen.

[1] Similarly the equivalence with $\exists$.

Not both (γ) and (δ) can be expected to emerge universally valid in the logic of items, because, once again, the logic includes principles like $(Ux)xh \supset .\ (\xi xxg)h$ and $\xi xxh = \xi xxh$ – and similarly for ϵ – inconsistent with Russell's (unformalised) theory of indefinite descriptions. The following properly qualified forms result in the theory of items:

$$\vdash (\epsilon xxg)E \equiv (\exists x)xg, \text{ i.e. } \xi x(xg \,\&\, xE)E \equiv .\ (Px)(xg \,\&\, xE).$$

For $\xi x(xg \,\&\, xE)E \supset .\ \xi x(xg \,\&\, xE)\text{ass}$

$$\supset .\ \xi x(xg \,\&\, xE)E \,\&\, \xi x(xg \,\&\, xE)g$$

$$\supset .\ (Px)(xg \,\&\, xE)$$

Conversely $(Px)(xg \,\&\, xE) \supset .\ \xi x(xg \,\&\, xE)g \,\&\, \xi x(xg \,\&\, xE)E$

$$\supset .\ \xi x(xg \,\&\, xE).$$

The strict equivalence, $\vdash (\epsilon xxy)E \mathrel{\text{⥽}} (\exists x)xg$, is similarly derivable. This can no more be regarded as providing an *analysis* of existence than the corresponding principle for definite descriptions. For such a connection would use E in order to define it, since it amounts to $\vdash (\epsilon xxg)E \mathrel{\text{⥽}} (Px)(xE \,\&\, xg)$. Essential use is made of the existential quantifier, a corresponding connection failing with neutral quantifiers. Classical theory in the style of Russell will have to look elsewhere for a noncircular account of existence.

$$\vdash \xi x(xg \,\&\, xf)f \equiv .\ (Px)(xg \,\&\, xf), \text{ provided } \xi x(xg \,\&\, xf)\text{ass}.$$

The proof generalises on the preceding proof.

$$\vdash (\xi xxg)f \supset (Px)(xg \,\&\, xf), \text{ provided } (\xi xxg)\text{ass}.$$

$$\vdash (\epsilon xxg)f \supset (\exists x)(xg \,\&\, xf), \text{ provided } (\epsilon xxg)\text{ass}.$$

$$\vdash (\exists x)(xg \,\&\, xf) \supset \epsilon x(xg \,\&\, xf)f.$$

6. *Other indefinite descriptions: "some", "an" and "any".* Are these analogues of Russell's principles strong enough: shouldn't

$$\Sigma. \qquad (Px)(xg \,\&\, xf) \supset (\xi xxg)f,$$

be a theorem? No, it is not valid. For consider:

Σ'. $\quad (Px)(x\,\mathrm{rd}\ \&\ x{\sim}\,\mathrm{rd}) \supset (\xi x x\,\mathrm{rd}){\sim}\mathrm{rd}$, and

Σ''. $\quad (Px)(x\,\mathrm{rd}\ \&\ x\,\mathrm{red}) \supset .\ (\xi x x\,\mathrm{rd})\,\mathrm{red}$.

In each case the antecedent is true, e.g. the antecedent of Σ' is vindicated by Meinong's round square. But the consequences are not true in general. For $\xi x x\,\mathrm{rd}$, on its intended interpretation, selects from the class of items an item a which is round. The item a picked out may not be non-round and it may not be red; for some round items exist and it is false of some round items that they are red. In this argument resort is had to the intended interpretation of the ξ-symbol as a choice function over subclasses of the class of all items.

An article "some" – often replaceable by "any" – with precisely this role certainly occurs in English (see OED); and it is of this "some" or "an" that a neutral formalisation has been attempted. But other uses of "some" than the choice "a" also occur in English (see OED; and for an attempt to sort some of these out, see Russell's earlier work, especially Russell 1937, and also Geach 1962). Most important among these is the unspecified (and perhaps unknown) particular, as in "some fool has locked the door" (OED), where "some" can be filled out "a particular". "A certain" is different, suggesting that the particular, although it is not being specified, is known. The ambiguous-value "a", read approximately "some or other", differs from "a certain"; but many of the unspecified particular cases are of the ambiguous-value sort. The basic linguistic test, of course, is whether "some" and "a" can be suitably replaced by "some ... or other". For instance, in "Spogmorth suspects a plumber" the "some or other" test typically fails.

The logic of *a certain* or *a definite*, symbolised κ, is essentially the same as that of names, and the theory is similar: *a certain* makes a specific nonarbitrary selection. "A certain" is rather like "Bill", only the specification is not restricted, e.g. to Bills; it could not too inaccurately be called an unrestricted variable proper name. The selection, which has to be made, and should be fixed for the given context, is contextually determined. Members of the audience may well not know the selection, and the speaker may be none too clear to the object selected or even whether it exists. As well as delimiting the selection, context may supply existence assumptions; and it may not. Where the logic,

like neutral logic so far developed, does not take account of context, the logical theory of κ reduces to the following formation rule:

Where A is a wff(characteristically retaining u free), κuA is a (full) subject term.

There are no characterising axioms: in a way *that* is what is distinctive (in a framework which admits only singular terms) about κ.

The logic of *some (or other)*, symbolised σ though usually reckoned to be straightforward, has its problems (as we saw in §16). The usual assumption is that σ can be eliminated in favour of the particular quantifier. But, even if $B(\sigma xA)$ could be generally replaced by $(Px \ni A)B$, the further replacement resulting in $(Px)(A \,\&\, B)$ is decidedly doubtful, as is now shown.

7. *Further comparisons with Russell's theory of indefinite and definite descriptions, and how scope is essential to avoid inconsistency*. Nothing however appears to stop the introduction of a formal descriptor, σ^*, like *some (or other)* but which is invariably eliminable in terms of P (or $\exists$), i.e. for which (Σ) does hold. That is, σ^* is a simple descriptor, subject to the following axiom scheme:

Σ^*. $\quad B(\sigma^* xA) \backsimeq (Px)(A \,\&\, B)$.

Since Σ^* yields immediately the thesis, $\vdash (\sigma^* xxg)E \backsimeq (\exists x)xg$, σ^* obviously approximates better to Russell's indefinite descriptor than ξ. And an existentially-loaded version of σ^*, defined thus: $\zeta xA = \sigma^* x(xE \,\&\, A)$, appears to correspond exactly. For $\vdash (\zeta xA)xy \backsimeq (\exists x)xg$ and $\vdash (\zeta xxg)f \backsimeq (\exists x)(xg \,\&\, xf)$, i.e. ($\gamma$) and ($\delta$) rewritten.

Unfortunately for this proposal Σ^*, invariant though it may appear, rapidly leads to inconsistency and thence triviality. Precisely the same would happen also to Russell's principle (δ) *were* it stated generally or – what one would expect to be legitimate – the rule of substitution applied to it to yield the scheme: $B(\text{an } x\ A) \equiv (\exists x)(A \,\&\, B)$. To show how σ^*, leads to collapse let C abbreviate $(B \,\&\, {\sim}B)$ and consider ${\sim}C(\sigma^* xC)$. By Σ^*, ${\sim}C(\sigma^* xC) \equiv (Px)(C \,\&\, {\sim}C)$. But ${\sim}(Px)(C \,\&\, {\sim}C)$, hence $C(\sigma^* xC)$, whence, by Σ^* again, $(Px)(C \,\&\, C)$, i.e. $(Px)C$, i.e. $(Px)(B \,\&\, {\sim}B)$, contradicting ${\sim}(Px)(B \,\&\, {\sim}B)$. Triviality follows then by paradox principles.

The trouble, as Russell saw it, is that two different scopes have been ascribed to the description in ${\sim}C(\sigma^* xC)$, scopes which may be distinguished thus: $[\sigma^* xC]\ {\sim}C(\sigma^* xC)$ and

$\sim[\sigma^* xC]\ C(\sigma^* xC)$. The inconsistency, and similar inconsistencies in unscoped versions of Russell's theory of definite descriptions are removed by writing the scope of a description into its definition or characterising axioms. But to say that a description has scope is to say that the descriptions depend, among other things, on the wff(or propositional function) that it applies to; and to say this is really to say that such descriptors are not simple operators but binary ones, that what should have been defined instead of $\sigma^* xA$ in Σ^* is the unscoped $\sigma^* x(A, B)$, with B showing the wff σ^* applies to, i.e. in effect the scope.

Neutral theories of both sorts, with scope and, most satisfactorily, using binary descriptors can readily be devised, e.g. by simply reexpressing Russell's scoped theories in neutral terms or by recasting them in terms of binary descriptors (cf. SE). Naturally theories of definite descriptions result in this way as well as theories of indefinite descriptions. Indeed much as different accounts of uniqueness tend to lead to different theories of definite descriptions, so different theories of indefinite descriptions typically furnish different theories of definite descriptions. The connection is of course the one we began with: that *the* is *a unique*.

8. *The two (the) round squares: pure objects and contextually determined uniqueness*. In natural language the uniqueness of a description is usually contextually determined: such was the conclusion reached in §14, p. 183 (which the present discussion continues). This happens with nonentities as well as entities: the red-headed man indicated may be the hero of a novel or the villain of a film. Whether he exists or not he will typically have many other features than being red-headed and a male human. He will be of a certain height, age, weight, temperament, etc. By contrast, the pure object, the red-headed man will not; it will have no other features, except perhaps those its characterisation implies. Thus we can distinguish

(a) pure or completely-specified objects, such as the (pure) round square, which is just round and square, and (so) has no other extensional features.[1] Of course it has other features, derivatively so to say, e.g. it is unique, you're thinking about it, etc.

[1] This is not Meinong's use of "pure", in which the pure object is one of *Aussersein*, it is pure in standing beyond being and nonbeing. Perhaps, a better term than "pure" can be found for such archetypal objects as the round square.

(b) Incompletely-specified or ordinary objects such as the round square which is also blue and quite small.

When definitely-described objects of sort (b) do not exist, difficulties with the uniqueness condition imposed for definiteness (often problematic even in the case of entities) is, as was shown, much accentuated – in part because of the sheer numbers of nonexistent objects of any given sort. The problem may be solved, it seems, in the same way as, and at once with, the problem of contextual specification of uniqueness. The proposed solution has two parts, one corresponding to D$\imath$2, which adds a contextual clause, and one corresponding to D$\imath$3 which appropriately complicates selection procedures. As to the first, a further qualification is imposed on the uniqueness clause, as follows:

$$\text{D}\imath 2^C. \quad \imath x A =_{\text{Df}} \xi x(A \,\&\, (z)(A^C \supset .\ z = y)),$$

where A^C adds to A a further condition to the effect that z belongs to the indicated context. The uniqueness clause may be alternatively written $(z \ni C)(A \supset .\ z = y)$ [where $\ni$ symbolises "belongs to" *—Eds.*]. The context of $\imath x A$ supplies a predicate (or class) C restricting the range within which uniqueness is claimed or asserted.

Other expected results and qualifications then follow from D$\imath 2^C$, much as in section 2 and 3. For example, it follows that $\imath x A$ exists iffthere exists a contextually unique x such that A, e.g. $\vdash (\imath x x g)E \leftrightarrows (\exists y)(yg \,\&\, (z \ni C)(zg \supset .\ z = y))$. Proof jazzes up the argument given in 2.

But D$\imath 2^C$ does not reflect well how we make further selections when the *full condition* fails, i.e. $\sim(Px)(A \,\&\, (z)A^C \supset .\ z = y)$. Consider the case where it is said "The red-headed man is gorging himself on meat pies again", where there are two red-headed men in the indicated context. What we don't say is that no statement is made, the claim is ill-defined, it's truth-value doesn't arise, or it's false. What we say rather is "Which one?". We request, or make, a further selection within red-headed men in the indicated context. Hence the second part of the proposal, which expands D$\imath 2^C$ to

$$\text{D}\imath 4^C. \quad \imath x A =_{\text{Df}} \begin{cases} \xi x(A \,\&\, (z)(A^C \supset .\ z = y)) & \text{where the full condition is met; and} \\ \xi x A & \text{otherwise.}[1] \end{cases}$$

Observe that the same sort of recipe will work for definitely described pure objects, only now the "context" is considerably narrowed, to those items with just A's presented features. There are various sorts of pure objects to deal with; for example:

P1. A simple case where the described object has only ch features.

P2. The object presents itself as having nonch features, e.g. "the existent round square", but the description may include much more elaborate predicates (which however can be contracted by abstraction axioms).

P3. The object has features implied by the features it is described as having. Strictly this case can be assimilated under P2; etc.

Consider P1, with $\imath xA$. By HCP and extensionality conditions there is a unique object z such that $A(z)$. Then $\imath xA$ is z. With P2 presented features should presumably be taken into account; e.g. the (pure) existent round square is round and square and s(existent). Again there is a unique object with these features which the description signifies.[1] A first stab at a more comprehensive definition might well go as follows:

$$\imath(\text{pure})xA =_{\text{Df}} \begin{cases} \xi x(x \text{ satisfies } s(A) \text{ and no more uniquely}); \text{ otherwise} \\ \xi x s(A) \end{cases}$$

9. *Solutions to Russell's puzzles for any theory as to denoting.* Solutions to the three puzzles (presented in OD, pp. 47–8), which Russell claimed "a theory as to denoting ought to be able to solve", are easily reached. These solutions are outlined here for the simple reason that Russell and many successors *take* them to be puzzles for the logic of descriptions; it should be observed, however, that the resolutions do not depend crucially on a particular theory of descriptions at all.

[1] *From previous page:* It could be argued that this is the beginning of a slippery slide. For consider the case where there is no red-headed man in the indicated context. It would, perhaps, be pointed out to the speaker: you made a mistake, you meant something else, some other person. Very likely a tolerant listener would make some other selection, probably among pie-gorging men. Such a selection, would violate desirable recursive features; but a further selection among men would not, though it would involve some technical difficulties. And so the selection proceeds outwards through categorially more comprehensive classes until it stops, at the class of all objects.

[1] There is one trick here: the (pure) s(existent) rs = the (pure) existent rs. But proving the identity requires a principle discussed later (see 7.9).

Puzzle (1) is caused by the adoption of Leibnitz's definition of identity. It is solved through use of extensional identity. For puzzle (1) is the following intensional paradox:

(a) George IV wished to know whether Scott was the author of Waverley.

(b) Scott *was* the author of Waverley.

Applying Leibnitz's identity principle it follows, what is false,

(c) George IV wished to know whether Scott was Scott.

But the sentence predicate "George IV wished to know whether . . . " is neither extensional nor modal while the identity (b) is a merely extensional identity. Hence (c) does not follow from (a) and (b). (a) and (b) are true but (c) is false. The solution turns only on the theory of identity, not on the theory of descriptions.

Puzzle (2) is undercut by rejecting the premiss on which it is based, that, by LEM, either "A is B" or "A is not B" must be true. As on Russell's theory neither "The present king of France is bald" nor "The present king of France is not bald" is true. But sentence LEM is not thereby violated; "It is not the case that the present king of France is (not) bald" is true.

Puzzle (3) is this: how can a nonentity be the subject of a proposition? But there is no reason, bar bad ones such as the Ontological Assumption, why the subject of a sentence must designate something actual. If A and B, for example, do not differ then

(d) The difference between A and B does not exist,

expresses a truth. Thus "the difference between A and B" signifies (in the wide sense) a nonexistent item (of higher order). There is no inconsistency in asserting that a nonexistent item does not exist; for in such existence denials the subjects do not carry ontological loading. In contrast,

(d′) $(\text{The difference between } A \text{ and } B)^{\text{E}}$ does not exist,

expresses not a truth but a logical falsehood. But (d) is quite distinct from (d′). The difficulties raised by existence-denials disappear when neutral subject terms, i.e. terms which do not carry ontological weighting, are used.

§23. Widening logical horizons: relevance, entailment, and the road to paraconsistency and a logical treatment of contradictory and paradoxical objects.

No logic is satisfactory without a good implication relation: implication and deducibility are at the heart of logic (see RLR, chapter 1). Yet the logics relied upon so far, classical and strict systems, contain only poor approximations to a good implication, namely the paradox-ridden material and strict connections.

1. *The importance of being relevant*. The full and powerful case for a relevant implication – which being relevant is paradox-free, that is avoids all the variants upon the paradoxes of implication – is detailed in companion works (notably RLR, but see also UL appended [reprinted in Vol. 4 *—Eds.*]), wherein is documented the extent to which systematic paradoxes and puzzles across wide areas of philosophy are engendered by starting out with a faulty irrelevant implication and how also the puzzles concerned are removed by switch to a good implication.

Two other examples: First, it is important for certain philosophical purposes to define a notion of *logically necessary existence*, to define "the existence of a depends logically on the existence of b". Hinckfuss 1976, who explains some crucial roles intended for the notion, shows that there are serious difficulties however in explicating the notion in terms of classical and modal apparatus, specifically in terms of strict implication and Russell's theory of descriptions. But in neutral logic with entailment, explication is unproblematic. The existence of a depends logically on the existence of b iff $aE \Rightarrow bE$, that a exists entails b exists. Hinckfuss's response (p. 125) to this point does not pass muster: "Logicians and philosophers are not agreed on what such a stronger notion of entailment amounts to" – that test would remove most notions of importance – "or even whether or not a full and consistent explication of some stronger notion of entailment is possible" – but such explications are not in doubt. Second, more to the point, strict implication induces several undesirable – not to say mistaken – results in the theory of objects itself. One example from Parsons' 1978 theory, which parallels Lewis's crazy result that there is (with strict equivalence giving identity) just one impossible proposition, is this: there is just one impossible object which is deductively closed.

It is especially important, in any logic designed to provide a decent account of nonexistent objects and of intensional relations, to have available *tight* relations of implication and entailment, i.e. logical necessary implication. For slack connections, such as material and strict implications, fudge distinctions and commonly lead, if taken with due seriousness, to undesired, sometimes highly undesirable, consequences. The really damaging effects of these classical connections[1] (strict is effectively classical when construed metalogically in terms of valid material implication) appear most strikingly where inconsistency figures, where inconsistent objects of inconsistent situations are under investigation. However the damaging effects are in fact much more widespread and occur where inconsistency does not figure, in particular where intensionality matters (see UL).

Classical theories, classical logics and their extensions, such as modal logics prevent the consideration of distinct inconsistent situations. The situation where a semantical paradox is enacted is the same as a situation where the (external negation) round square is both round and such that it is not the case that it is round (i.e. $(\mathrm{rs})r \;\&\; {\sim}(\mathrm{rs})r$); both collapse into the trivial situation, the *one* classical inconsistent situation, where everything holds. This is at serious variance with the facts. The collapse of different inconsistent situations to triviality is due basically to paradoxes of implication which spread any inconsistency, including relatively isolated ones, everywhere, i.e. to the principles

$$A \;\&\; {\sim}A \supset B \text{ (\textit{ex falso quodlibet})}; \quad A \;\&\; {\sim}A \dashv\!\!\supset B \text{ (\textit{ex impossibile quodlibet})}.$$

Such collapse effects are, however, removed with appropriate introduction of relevant implication.

It is evident then that no classical theory can provide a proper theory of radically inconsistent objects which have contradictory properties. *That is why such objects are variously said to be beyond the scope of logic, illogical, incorrigible*, and so on – *when the basis for these claims is merely that they are beyond the narrow scope of classical theory*, are classically illogical, etc. At best within classical theory there can be approximations to radically inconsistent objects by way of predicate negation and its variants, such as internal property negation.

[1] If classical relations such as material implication, can be so called. In traditional terms, material implication provides not a connection but rather an accidental "conjunction".

The way classical theory treats of – or rather *fails* to treat – inconsistency represents but the tip of the iceberg. It is simply that the effects where inconsistency is not directly involved are a little less blatant (otherwise, too, classical logic would not have enjoyed the amazing, and undeserved, inside running it has had).

A good logic will include then a good implication, ideally a relevant implication, $\rightarrow$, which can be interpreted as a sufficiency relation, so that $A \rightarrow B$ may be read: A is sufficient (on its own) for B, i.e. the relation is not enthymematic and does not suppress assumptions that are made (as e.g. intuitionistic and "minimal" implication do). If $\rightarrow$ is not a logical relation then a good logic will include also an entailment relation $\Rightarrow$, which may be defined $A \Rightarrow B =_{\text{Df}} \Box(A \rightarrow B)$, i.e. entailment is logically necessary implication, and represents logical sufficiency. Thus $\Rightarrow$ supplants strict implication as $\rightarrow$ supplants material.

2. *Zero-order and quantified relevant logics: syntax and semantics*. A detailed account of relevant logics is presented in the companion volume RLR. Here then only some of the theory will be lightly sketched (more will be found in UL, appended [cf. Vol. 4 *—Eds.*]). The vocabulary of the simpler systems differs from that of SQ or Q only by the addition of the primitive connective $\rightarrow$ which conforms to the rule: if A and B are wff, so is $(A \rightarrow B)$. Less simple systems (studied in RLR) add $\Rightarrow$ or $\Box$ as well and perhaps other connectives. Let us suppose that $\rightarrow$, $\sim$, $\&$ are taken as primitive connectives. Further connectives are defined: in particular $A \vee B =_{\text{Df}} \sim(\sim A \,\&\, \sim B)$; $A \leftrightarrow B =_{\text{Df}} (A \rightarrow B) \,\&\, (B \rightarrow A)$; $A \supset B =_{\text{Df}} \sim(A \,\&\, \sim B)$.

The postulates of the basic zero-order relevant system BSQ are as follows (B is studied in RLR, chapter 3, where its theorems and nontheorems, virtues and limitations are pointed out; BQ is investigated in Routley 1979a):

Sentential schemes: $A \rightarrow A$; $A \,\&\, B \rightarrow A$; $A \,\&\, B \rightarrow B$; $(A \rightarrow B) \,\&\, (A \rightarrow C) \rightarrow . \; A \rightarrow (B \,\&\, C)$; $A \,\&\, (B \vee C) \rightarrow . \; (A \,\&\, B) \vee (A \,\&\, C)$; $A \rightarrow \sim\sim A$; $\sim\sim A \rightarrow A$.

Inference rules: $A, \; A \rightarrow B \twoheadrightarrow B$; $A, \; B \twoheadrightarrow A \,\&\, B$; $A \rightarrow B, \; C \rightarrow D \twoheadrightarrow B \rightarrow C \rightarrow . \; A \rightarrow D$ (Affixing); $A \rightarrow B \twoheadrightarrow \sim B \rightarrow \sim A$.

The quantificational schemes, added to get from BSQ to BQ, are essentially the same as those of S2Q, namely:

Quantificational schemes: $(Ux)A \to A(t/x)$, for any term t; $(Ux)(A \to B) \to .\ A \to (Ux)B$, where x is not free in A; $(Ux)(A \vee B) \to .\ A \vee (Ux)B$, where x is not free in A; $(Ux)(A \to B) \to .\ (Px)A \to B$, where x is not free in B, and P is defined as usual (i.e. $(Px)A =_{\mathrm{Df}} {\sim}(Ux){\sim}A$); $A \to (Ux)A$.

The main interest lies in systems that are stronger than B (and BQ), but not too much stronger; for example not nearly as strong as the main systems studied in ABE, but in the vicinity of systems DL and DK (of UL and DLSM), obtained by including such principles as Contraposition and Excluded Middle.

Perhaps more illuminating than the syntactical systems is the semantical theory, which is noneist in character. The too-narrowly-circumscribed class of complete possible worlds of modal semantics is expanded enormously to include both impossible worlds and incomplete worlds. The modal restriction to complete possible worlds is obviously a mistake when the object is – as Lewis's object in formulating modal logics was – to capture the theory of deducibility. For deducibility is not limited to complete worlds or possible worlds. The class of deductive worlds is far wider than those modal semantics considers. An *impossible* (or inconsistent) *world* is one where some statement A and its (external) negation ${\sim}A$ both hold; an *incomplete world* is one where for some statement A, neither A nor ${\sim}A$ hold. It is evident that classical evaluation rules for negation break down for inconsistent and incomplete worlds (though students brainwashed in classical theory appear to have great difficulty in appreciating this elementary fact). For if both A and ${\sim}A$ hold in world b, a rule like the classical rule which tells us that, as ${\sim}A$ holds in b, A does not hold in b is automatically in doubt, and faulted on reflection. Similarly if neither A nor ${\sim}A$ hold in c a rule like the classical one which insists that one or other of them holds in c is defective.[1] Accordingly a rule that is a little less crude than the classical evaluation rule for negation is required to evaluate negation once the class of worlds is duly expanded to include all deductive situations. A more sophisticated rule, without classical defect, can be obtained by considering reverse situations. The reverse a^* of world a, the world such that whatever A, if ${\sim}A$ holds in a then A does not hold in a^*. (A reverse world is like the reverse side of something, e.g. a gramophone record.)

[1] For related reasons classical negation, evaluated classically, is neither the determinable negation of English nor the principal determinant. The assumption that classical negation is the negation of natural language is a largely unexamined, and quite defective, assumption: see RLR, chapter 2. Classical negation is a fairly natural, but nonetheless illegitimate, extrapolation from the restricted otherness connection, which is the principal negation determinant.

Apart from operation * the elements of a BQ model differ from those of an S2Q model only in replacing two-place relation R by a three-place relation, the latter being essential if the irrelevance of strict implication is to be removed.[α] But for certain extensions of BQ a further subclass O of K is required: O is the set of all regular worlds, those worlds where all theorems hold. A BQ model M is accordingly the structure $M = \langle T, O, K, R, {}^*, D, I\rangle$ where $T \in O \subseteq K$, R is a 3-place relation and * a 1-place operation on K, D is a (nonnull) domain of objects, and I an interpretation function. Apart from I, M is constrained for every $a, b, c, d \in K$ by the following conditions, in which $a \leq b =_{\text{Df}} (Px)(Ox \;\&\; Rxab)$:

p1. $a \leq a$

p2. If $a \leq d$ and $Rdbc$ then $Rabc$.

p3. $a = a^{**}$

p4. If $a \leq b$ then $b^* \leq a^*$.

Interpretation I is a function which assigns to each subject term t (i.e. subject variable or constant) an element $I(t)$ of D, to each n-place predicate parameter f^n at each world a of K, an n-place relation on K (extensionally, a subset of K^n), and to each sentential parameter p at each a in K exactly one of the values $\{1, 0\}$; subject always to the constraints for a and b in K:

(1) if $a \leq b$ and $I(p, a) = 1$ then $I(p, b) = 1$, and

(1′) if $a \leq b$ then $I(f^n, a) \subseteq I(f^n, b)$.

Interpretation I is extended generally to all wffas follows: $I(f(t_1, \ldots, t_n), a) = 1$ iff $\langle I(t_1), \ldots, I(t_n)\rangle \curlywedge I(f^n, a)$, i.e. i ff the interpretations of terms$t_1, \ldots, t_n$ instantiate the relation assigned to n-place predicate f^n at world a; $I(A \;\&\; B, a) = 1$ iff $I(A, a) = 1 = I(B, a)$; $I(\sim A, a) = 1$ iff $I(A, a^*) \neq 1$; $I(A \to B, a) = 1$ iff, for every b and c in K, if $Rabc$ and $I(A, b) = 1$ then materially $I(B, b) = 1$; $I((Ux)A, a) = 1$ iff $I^x(A, a) = 1$ for every x-variant I^x of I, where I^x is an x-variant of I iff I^x differs from I at most in assignments to x (the *elementary* rule).

The main semantical notions, defined are just as for S2Q. That is, generalising, a wff A is *true in* M just in case $I(A, T) = 1$, and *false in* M otherwise. A is LQ-*valid* iff

[α] Thus, we see the introduction of *, known as the "Routley star" operation, and the Routley ternary-relation semantics for relevant logic – a breakthrough in the semantics for such logics first described in Routley[2] 1972 —*Eds.*.

A is true in all LQ models, and *invalid* otherwise. A set Δ of wffis LQ *simultaneously satisfiable* ifffor some LQ model M, every wff A in Δ is true in M. The adequacy of the semantics, in particular that theorems and only theorems are valid, is shown along the lines of Routley 1979a. As in the modal case, extensions of BQ are modelled by adding conditions to the semantics for BQ. Three examples:

Axiom scheme	Modelling condition
$A \vee {\sim}A$	$x^* \leq x$ for $x \in O$
$A \,\&\, (A{\rightarrow}B) \rightarrow B$	$Raaa$
$(A{\rightarrow}B) \,\&\, (B{\rightarrow}C) \rightarrow A{\rightarrow}C$	if $Rabc$ then for some x in K $Rabx$ and $Raxc$

In systems which correctly include LEM, $A \vee {\sim}A$, that is in extensions of GQ ($G = B + [A \vee {\sim}A]$), only "normal" or classical models are required, where a model structure is normal if $T = T^*$. But for dialectical applications, where both A and ${\sim}A$ hold for some A, such a classical condition cannot be imposed.

3. *Object-theoretic elaboration of relevant logic.* As base logic some fairly minimal extension of GQ will be chosen (e.g. some system in the vicinity of DKQ of UL). To render the logic adequate as a logic of items it will have to be much enriched, in a way parallel to the progressive enlargement of neutral modal logic already presented. Some of the enrichment is straightforward, some is not (as explained in 5 below). Among the more straightforward pieces are these:

Predicate and internal negation. The logic of predicate negation can be directly transferred from modal logic to relevant logic, the double negation axiom becoming $\underset{\sim}{t}{\sim}{\sim}f \leftrightarrow \underset{\sim}{t}f$. The semantics are as before, but they can alternatively be neatly combined with those for internal negation. Furthermore internal negation can be seen as extending predicate negation, the axiomatic connection being: where A is of the form $\underset{\sim}{t}f$, $\vdash \overline{\underset{\sim}{t}f} \leftrightarrow \underset{\sim}{t}{\sim}f$.

How internal negation is evaluated turns on whether it conforms to a contraposition rule, $A{\rightarrow}B \dashrightarrow \bar{B}{\rightarrow}\bar{A}$, or not.

If it does, and so induces a corresponding *rule* for predicate negation, then

$$I(\bar{A}, a) = 1 \quad \text{iff} \quad I(A, a^\dagger) \neq 1,$$

where $\dagger$ is an operation on K such that $a^{\dagger\dagger} = a$ and if $a \leq b$ then $b^\dagger \leq a^\dagger$. If it does not then a more complex semantical rule of the type considered in §24 is one alternative.

(Full details of both sorts of cases are presented in RLR, chapters 7 and 8).

Existence and possibility predicates may be introduced as in the neutral-modal presentation.

Second-order relevant logics. Syntactical details resemble those in the modal case. For 2GQC substitution and other schemes are liberalised to admit predicate and sentential schemes. For 2GQ, abstraction with $\leftrightarrow$ as the main connective is also added, i.e. the relevant formulation is

$$(Pf)(\underset{\sim}{x})(\underset{\sim}{x}f \leftrightarrow A), \text{ with } f \text{ not free in } A.$$

Semantical analysis too parallels the modal case. So also does the introduction of λ-abstracts, given (what is problematic) that identity of predicates is defined as in the modal case.

Characterisation postulates. Such principles as HCP which avoid ξ can be introduced forthwith, again with $\leftrightarrow$ as main connective, i.e. the relevant formulation is

$$(Px)(\mathrm{ch}f)(xf \leftrightarrow A), \text{ with } x \text{ not free in } A.$$

Similarly for KCP.

4. *Relevant paraconsistent logics, and radically contradictory and paradoxical objects.* A logic L is *paraconsistent* iffor some theory S for which L is an underlying logic (i.e. S includes all axioms of L and is closed under the rules of L), S is (simply) inconsistent but nontrivial i.e. for some wff A both A and $\sim A$ hold in S but not every wffholds in S.[1] That is, paraconsistent logics are logics which have nontrivial inconsistent extensions; and so they include narrowly paraconsistent, or dialectical logics, i.e. nontrivial inconsistent logics. A *putatively paraconsistent* (pp) logic or theory is one which is inconsistent and putatively nontrivial.

Relevant logics which do not include the rule γ of Material Detachment (i.e. A, $\sim A \vee B \rightarrow B$) are paraconsistent logics. Though relevant logics by no means exhaust paraconsistent logics, they are the most satisfactory paraconsistent logics (so it is contended in DLSM). No logic (with normal conjunction and disjunction) including γ or the

[1] Strictly this defines paraconsistency of L wrt negation $\sim$. For a fuller account, and a valuable survey of paraconsistent logics, see Arruda 1979. [See also Priest, Routley and Norman 1989 *—Eds.*].

central paradoxes of implication, such as $A \,\&\, {\sim}A \rightarrow B$, is paraconsistent. For these principles trivialise any inconsistent extension. But relevant logics were precisely and carefully fashioned to avoid such paradoxes while ruling out no valid arguments (this contentious thesis is defended in RLR). Rival irrelevant paraconsistent logics characteristically weaken the negation logic and so do rule out intuitively valid arguments (e.g. full double negation principles or forms of contraposition).

Relevant logics without γ, such as BQ, leave it open whether the actual world T (of the semantical theory) is consistent or not. The thought soon occurs to anyone who has struggled with paradoxes, especially such apparently true contradictions as those the logico-semantical paradoxes yield, that perhaps the world is not consistent. And if it is not then the paradoxes can simply be accepted, not as "paradoxes" any longer, but as involving valid reasoning and as yielding isolated "true contradictions". One of the really big attractions of certain paraconsistent logics[1] is that having adopted them (as underlying logics) one can apparently forget about complicated restrictions on or replacements for abstraction principles and the like (i.e. on CPs of higher order: see §5) in order to avoid logico-semantical paradoxes. Abstraction principles can be formulated in their intuitive ("naive") forms without order, types, separation, stratification, or other restrictions, and attribute abstracts (as introduced in 1.18(4)) can be freely admitted to subject places.

With the paraconsistent assimilation of the paradoxes (as further explained in UL appended [cf. Vol. 4 *—Eds.*]) can go much desirable simplification in logical theory. Not only can abstraction principles revert to intuitive forms, but much auxiliary apparatus – not part of natural languages, but designed to shield formal languages from the effects of the paradoxes (while conveniently admitting reduced versions of these as "deep" limitative theorems) – can be largely jettisoned, e.g. language and type hierarchies, levels of language theories, and exaggerated insistence on use-mention distinctions.

A corollary of the paraconsistent neutralisation of the paradoxes for the theory of items is that paradoxical objects such as the Russell class (i.e. $\{x : x \notin x\}$), the liar statement (i.e. "This very statement is false") and the impredicativity property, can be treated as genuine objects, i.e. thesis M1 (stated on p. 3) is not violated by such objects.

[1] On the other attractions of paraconsistent logics, see Arruda 1979 and DLSM [and Priest, Routley and Norman 1989 *—Eds.*].

Paraconsistency likewise *can* admit radically inconsistent, or contradictory, objects such as these objects for which A and $\sim A$ both hold, e.g. $\imath x(xr \ \& \sim xr)$, to full defensibility. Then $dr \ \& \sim dr$ where $d \approx \imath x(xr \ \& \sim xr)$. Moreover this can be done while maintaining, what 2GQ has as a thesis, LNC. It is sometimes thought that paraconsistent logics *must* reject LNC. This is an error. The argument for excluding LNC from paraconsistent logics turns on accepting what paraconsistent logics have already rejected, namely a consistency assumption. Otherwise the presence of $p_o \ \& \sim p_o$ in a logic does not force the rejection of $\sim(A \ \& \sim A)$, but simply induces, what the logic will contain anyway (e.g. through principles such as $p_o \ \& \sim p_o \rightarrow .\ (p_o \ \& \sim p_o) \vee B$), derived inconsistencies.

5. *Problems in applying a fully relevant resolution in formalising the theory of items; and quasi-relevantism*. In order to construct the theory of items on a relevant logical basis, the logical foundations on which the theory has been built will have to be reworked relevantly. Some of the work has already been indicated in 3, e.g. the theory of internal negation, and the formulation of second-order relevant logics and semantics (with predicate quantifiers understood truth-valuedly); some of the further work is fairly straightforward; but there are several hitches, deserving mention, which in some measure account for the modal approach of preceding sections. The hitches are these:

a. *Identity*. Analogues of the orthodox principles for identity lead to irrelevance (of unacceptible sorts); see UL. An appealing repair in first-order theories involves conjoining certain theorems to the antecedent of =2. For example, the scheme in relevant quantificational logic can take the form:

$$x = y \ \& \ (A(x) \rightarrow A(x)) \rightarrow .\ A(x) \rightarrow A(y),$$

subject to the full proviso, thereby rendering specific the form, $x = y \ \& \underset{\sim}{t} \rightarrow .\ A(x) \rightarrow A(y)$, with the same proviso. Here $\underset{\sim}{t}$ is a sentential constant governed by the two-way rule, $A \dashv\vdash \underset{\sim}{t} \rightarrow A$, which serves to represent the conjunction of all theorems. But even though such theories can be made to work they only complicate the issue of how to handle identity in second-order theory. There are at least two problems: firstly, whether the first-order forms can be converted to definitional form, and secondly, whether orthodox second-order definitions can be avoided (they can: see below).

b. *Restricted variables*. The classical logical theory, itself hardly free of difficulties, cannot be taken over, because of the heavy and essential reliance on defective principles such as Disjunctive Syllogism. A different theory will have to be devised. It *looks* as if such can be obtained through an intensional functor *such that*. But the adequacy of such a theory has yet to be established.

c. *Choice operators and ξ-terms*. The choice principle, reformulated for relevant implication as

$$\mathrm{A}\xi. \qquad A(t/x) \to A(\xi x A),$$

leads to irrelevance of a sort, e.g. to such results as $tf \;\&\; {\sim}tf \to .\; uf \vee {\sim}uf$ where u and t are arbitrary terms that may have nothing to do with one another (see PLO, p. 223). Worse if a second-order form of Aξ is adopted, for sentential parameters, outright irrelevance (of an RMingle type) results, such as $p \;\&\; {\sim}p \to .\; q \vee {\sim}q$. The problem is to devise a satisfactory replacement for Aξ. Affected thereby also is the question of the shape of theories of definite and indefinite descriptions in relevant logic. As with hitch (i), a suitable relevant-inducing repair takes the form: $A(t) \;\&\; \underset{\sim}{t} \to .\; A(\xi x A)$, so at least it was suggested in PLO, p. 225; and perhaps that form can be replaced by the more specific form: $A(t) \;\&\; (A(t) \to A(t)) \to .\; A(\xi x A)$. But the actual route to irrelevance from Aξ makes use of wffwhich are not self-consistent, i.e. which imply their own negations (and so merges directly with the problem of choices where the antecedent of Aξ is not satisfiable). Accordingly alternative modifications well worth investigating are those that add to Aξ, in one way or another, the proviso: where A is self-consistent.[1] Such modifications have their costs: the neat elimination of quantifiers (in LR model logics with ξ) appears to be frustrated by all the modifications considered. These hitches underlie others, e.g. identity, the theory of functions; restricted variables, the theory of syllogistic inference and implication; choice, the theory of descriptions.

Note well that hitches (a) and (c) concern relevance of a sort that certainly seems unimportant for paraconsistent purposes. For the types of irrelevance that emerge from these theories are of very limited sorts (typically involving necessary consequents) which do not spread (solid evidence for this in certain cases comes from nontriviality proofs).

[1] It is an unexpected bonus for connexive logics, where all wffare self-consistent, that an unqualified ξ-scheme can apparently be added without inducing irrelevance.

This is the genesis of quasi-relevantism, a go-for-broke expedient which simply takes over (with due relevant transcription) the identity theory and choice and description theory already elaborated and which tries to get by, in one way or another (extra postulates at worst), with relevantly restricted variables.

Even if the hitches are resolved, as one can be moderately confident they will be, or bypassed, as irrelevant for paraconsistency, much work will remain to be done. Since relevant logics or quasi-relevant logics that can be paraconsistently applied do not include all classical logic principles,[1] many classical arguments will have to be recast: the adequacy of classical arguments can seldom be reliably assumed.

6. *On limits to postulation and its equivalents, e.g. definitional introduction.* An important issue which arises from the postulational method, and from the use of Characterisation Postulates in particular is, what can one assume? And what does postulation or supposition do?

First of all, postulation is much more extensive than is commonly supposed: it affects conventions in the shape, for instance, of semantic or other rules; it includes definitions, whose normal operations, e.g. through identity and replacement, yield definite assumptions. In each of these cases postulation has to be controlled. Because some notions are determined (by other postulates, by how things are, etc.), one is not free to postulate anything one likes, to adopt any conventions or definitions one likes, and expect correctness. To do so would be a bit like expecting to be able to write in an unqualified CP without trouble.

To return to the initial questions. There is no limit to what one can consider or introduce or assume, but the objects introduced may not have the properties they present themselves as having and they may impose logical constraints they are not seen as introducing. Postulation in any of its forms may severely restrict the field of investigation, the class of cases being investigated. A striking and important example is the introduction of a classical-style negation to the semantics for relevant logics. Suppose one introduces a negation $\neg$ subject to the "convention", or semantical rule:

$$I(\overline{A}, a) = 1 \quad \text{iff} \quad I(A, a) \neq 1,$$

[1] GQ includes all theorems of Q; but γ is only an admissible derived rule of GQ, and does not hold for dialectical extensions of GQ.

assuming that it holds for all (normal) situations a of the semantics. Then this is a postulate, and one with damaging effects for relevance. For in virtue of the semantical rules for other connectives, such paradoxes as $A \,\&\, \overline{A} \rightarrow B$ and $B \rightarrow .\ A \vee \overline{A}$ are rendered valid. In fact the postulated condition *narrows* the class of situations that can be considered and from this point of view is highly undesirable. It rules out situations where $A \,\&\, \overline{A}$ may hold but B does not, for example. It rules out, in short, situations that are inconsistent or incomplete with respect to $\neg$ negations. Thus one is not free to introduce $\neg$ negation if one likes, given such important objectives as those of ensuring that for every wffthere is some situation where it holds and some where it fails.

This sort of phenomenon becomes especially important where the additions would instate or reinstate paradox or unwanted inconsistency, where (unlike $\neg$ in sentential contexts) the extensions are not conservative. The addition of what often seem innocuous definitions may do just such damaging things. A simple example (due to Dunn and discussed in RLR, chapter 4) is the trivialising effect of the connective fusion when added, subject to its basic rules, to dialectical set theory. That is, paraconsistency may be destroyed by what can look (at first) like little more than definitional introduction. Another example (to be considered in chapter 4 [reprinted in Vol. 2 *—Eds.*]) is Tooley's addition of a prime disjunction to a Parsons'-style theory of Meinongian objects, the addition rendering the theory inconsistent, and indeed trivial.

7. *Living with inconsistency.* A common objection, even fear, is that paraconsistent positions (such as that sketched) remove our main, and most important, argumentative weapon, namely the conclusive damage done to a position by having shown it inconsistent. "Whereas formerly, inconsistency in a position was a fatal criticism of it, now an opponent whose position has been proved inconsistent can cheerfully say: So what!" It is certainly true that the inconsistency charge has been – and, subject to some qualification remains, as will be argued – an important argumentative weapon: been fundamental in coherence theories of truth, central in formalist philosophies of mathematics, and basic in pragmatism, where inconsistency in a theory is assumed to force revision always.[1]

[1] Thus Haack 1974, p. 36: "It is true that, unless it is assumed that a contradiction cannot be true, the concept of *recalcitrance* cannot play its crucial role in the pragmatist picture". Haack's subsequent argument against a paraconsistent undermining of pragmatism is entirely fallacious; for it imports from nowhere the further assumption that from a contradiction anything can be derived.

But *why* has consistency been taken to be so fundamental? Because it has been regarded as a guide to *truth*; sometimes even, mistakenly, in formalist philosophies, as the determinant of truth. An inconsistent theory cannot be true, that is the classical assumption, which paraconsistent positions reject. But inconsistency never was quite as conclusive a criticism as the objection suggests: it was no doubt conclusive in certain circles, e.g. those of empiricism and pragmatism, but those who think it generally conclusive have lived sheltered lives. Consider a dialectician such as Proudhon, who was not in the least deterred by encountering a contradiction in his theory. Proudhon could still be argued with and persuaded; and he was not committed to everything or beyond the scope of ratiocinative or logical methods.

A more comprehensive account is needed, then, which does not leave consistency as an ultimate test, but which explains its point, e.g. when it is a good criticism, and accounts for its limitations, e.g. in the region of logical paradox. A useful beginning can be made on this question by bringing it down to a practical level: it is worth asking how we, and how paraconsistent people, do argue, what use they make of consistency, and how they proceed in its absence.[1] The answers will help show that and how it is possible to live with isolated inconsistency. Some of the arguments of this book (and of UL especially) try to show why it is rational to do so.

§24. Beyond quantified intensional logics: neutral structure theory, free λ-categorical languages and logics, and universal semantics.

The logical theory thus far elaborated is already substantially richer, especially in – what matters philosophically – intensional idioms, than usual logics. Furthermore it meets conditions of adequacy earlier specified (mainly towards the end of part III); by contrast orthodox logics do not. In particular, the logic is ontologically neutral, not presupposing existential claims; definite and indefinite descriptions appear in it as values of variables; the basic quantifiers are nonontological; the ontic predicates "E" and "$\Diamond$" are included in the theory and satisfy weak requirements of adequacy; the working implication and entailment relations (of the projected theory) are relatively paradox-free; and finally the logic permits the symbolisation and assessment of a great many arguments that cannot be

[1] The topic breached is a large one: it will have to be taken up again elsewhere, in combination with the preliminary theory of DLSM of types of inconsistency (e.g. unacceptable and acceptable).

satisfactorily handled in classical logic. For example, the logic, when applied, facilitates the symbolisation of sentences like those cited early in part I (on p. 12).[1] It also enables the assessment of many arguments that have been (mistakenly) considered to be beyond formal reach or to present severe problems for any logic.

Even so the logical theory outlined is no panacea: there is still much it cannot accomplish and much it cannot account for satisfactorily or at all. It is true that many of the known short-comings can be remedied by piecemeal additions to the logical theory, e.g. predicate and other modifiers can be added to quantified intensional logics, so can common nouns, so can further descriptions and quantifiers, the semantical theory can be enriched to allow for contextual variation, and so forth. Nonetheless there are great advantages in having from the outset a more comprehensive and flexible framework. For even given the augmentations of quantified intensional logic mentioned we should still be far from having logical systems rich enough for the analysis of much of English discourse.

On the so-called syntactical front (which includes however, as well as morphology, the question of postulates, i.e. axiom schemes and inferential rules), there are two main classes of problems in devising logical languages of the order of natural languages, both serious enough; namely, that of determining an adequate morphological structure, and that of working out the associated axiomatic constraints. Ways of rectifying the worst morphological deficiencies of formal languages, as bases for natural language grammars, have been known since the Thirties, ways that again seem promising now that a transformational component offers hope of smoothing the remainder of the way to natural language grammars; but appropriate axiomatic treatment of fully intensional notions, as

[1] The labelled sentences are now symbolised in turn, using fairly obvious symbols for predicate constants.

(α) $(\Sigma x)(p^{\mathrm{E}}\ l\ x\ \&\ (x = \imath zzf))$

(β) $(\imath zzf)\ l\ (\kappa xxc)$

(γ) $(\exists z)[zp\ \&\ (y)(y{\sim}E\ \&\ ym \supset .\ z{\sim}ByE)]$

(δ) $(\Sigma t)(Pz)[\xi z(zp\ \&\ zE)w\ z(t)\ \&\ z(t){\sim}E]$

(ε) $(Px)[\imath yym\ Tx\ \&\ {\sim}xE\ \&\ .\ x \equiv \xi z(zr\ \&\ zs)]$

(ζ) $jK(Px){\sim}E\ \&\ (Px)jK\ x{\sim}E$

(η) $(\exists x)[xm\ \&\ xB(y)(y\Diamond \supset yE)\ \&\ {\sim}(y)(y\Diamond \supset yE)$

Naturally some *due* allowance has still to be made because of the comparative paucity of the current notation as compared with the richness and subtlety of English. (Hence too such rough approximations as that for *mistake*.) The unlabelled sentences are also readily symbolised, in a similarly approximate fashion.

distinct from modal notions, is only in its infancy, and only recently have such important notions as entailment obtained partial formalisations. Even the question of the incorporation of descriptions and extensional identity into quantificational formalisations of these theories leads, as was seen, to a series of so far largely uninvestigated and unresolved issues.

There are two common ways of enriching the morphology of formal languages: either by enlarging the formation rules in the style of a phrase structure grammar which adds as required new grammatical categories and corresponding combination rules, or by switching to a functorial (i.e. categorial) grammar, where new grammatical categories and their controlling rules are derived functorially from a finite set of base grammatical classes. The methods can of course be combined, and in any case the second method amounts to but an important special case of the first since functorial grammars can always be reformulated as phrase structure grammars. The functorial method has great appeal to logicians; for it has, as Ajdukiewicz 1935 pointed out, considerable power combined with simplicity, only one or two rules being required to generate a wealth of forms, many of which require separate phrase structure rules; and it has the important merit of running in tandem with functorial semantical methods.

The fact, which has only recently come to be appreciated, is that there is a ready-made formal and semantical theory which leads itself admirably to reinterpretation as a theory with a functorial grammar, which so reinterpreted takes up all that Ajdukiewicz was striving for with his full theory of syntactic connexion and which is ripe for intensional and also significance enlargements. The theory is the simple theory of types, as formulated by Church 1940 (in the form which excludes arithmetic) and furnished with a semantics by Henkin 1950. Let there be no mistake about what is claimed and what is not: simple type theory is inadequate as a theory of significance (which is what Russell thought type theory was), thoroughly unsatisfactory as a set theory and as a way of resolving the logical paradoxes (which is how the theory is usually regarded nowadays), but extremely promising when reequipped as a basic logic for discourse. When the simple theory of types is so revamped linguistically, it provides a ready-made base for improvements much superior to quantification theory, which it of course includes. Nor is there anything particularly new about construing type theory as a logical theory built on a functorial grammar. Russell himself, after early vacillation, came down, in order to meet Black's objection to the theory, in favour of interpreting types syntactically (see Russell 1944,

pp. 691–2), and the Hilbert school re-expressed the linguistic type rules as formation rules, thereby establishing the modern practice of treating type theory as providing a grammar. Unfortunately however currently prevailing practice has also tended to recast type theory as a set theory and to interpret types ontologically rather than linguistically, thereby throwing away all the advantages and most of the initial plausibility of simple type theory. To avoid confusion of the syntactic construal of the theory with the prevailing one, the theory will be called *structure theory*, and the labels not type symbols but structure labels of grammatical category symbols. As formulated by Church the theory has in effect only two basic grammatical categories, declarative sentences with structure label o, or 0, and subjects (proper names on a narrower – too narrow – construal) with structure label ι, or 1. There are however good reasons for not stopping at two, for including as basic categories at least general terms (including common nouns),[1] with structure label 2 say, and perhaps also imperatival sentences and question sentences. Assume then that there are finitely many basic categories including at least those labelled by 0, 1 and 2. There is just one rule for generating derived grammatical categories, reflected in the following formation rule:

If α and β are structure labels so is $(\alpha\beta)$, or in Ajdukiewicz's notation $\alpha|\beta$.

The derived category with label $(\alpha\beta)$ consists of parts of speech which take an expression with label β and yield one with label α; for example one-place predicates have label (01) since such predicates take a subject and deliver a sentence, and similarly two-place predicates have label ((01)1). This functional mode of category derivation is an outcome of the following recursive formation rule (which is but Ajdukiewicz' central rule):

2. If E and F are wfps (well-formed phrases) with structure labels $(\alpha\beta)$ and β respectively then (EF) is a wfp with structure label α.

This rule is of course underpinned by a base rule

1. A variable or constant alone is a wfp with structure label as specified:

[1] Lewis 1970–71 does include these as a basic grammatical category and Ajdukiewicz 1935 was tempted to do so. As a penalty for not succumbing the Ajdukiewicz theory will generate – when applied to English, not Polish – a stack of ungrammatical sentences, e.g. "The man hit man", "A rose hit man and rose smells". What is worse, though it is not a punishment for succumbing, the Lewis theory fails to generate such sentences as "Porky is yellow", "Porky is a pig" (as distinct from "A pig is Porky") and "Porky is something" from the lexicon specified (on p. 172). But Lewis would no doubt try to argue that such sentences can be recovered transformationally.

and this rule is in turn underpinned by a listing of primitive symbols and their respective structure labels. The primitive symbols consist of a (denumerable) set of variables or parameters for each structure label, parentheses, and a set of constants, which include in the extensional-two-valued case the constants N (for negation) with label (oo), K (conjunction) with label ((oo)o), π (universalization, read "everything") with label (o(oα)) and ϵ (arbitrary selection)[1] with label (α(oα)), where for an expanded quantification theory α is ι (and where, for a more general theory, which however introduces expressions whose grammatical well-formation is decidedly questionable, α is any structure label). In Church's formulation the functional abstraction symbol λ is classified, along with parentheses, as an improper symbol, and the following formation rule is added for λ-expressions:

3. If E is a wfp with structure label α and w is a variable with label β then (λwE) is a wfp with label ($\alpha\beta$).

However this rule can be reduced, at the cost of enlarging the syntax marginally, to a case of rule 2 by reclassifying λ as a constant with label ((($\alpha\beta$)α)β) which always applies to a variable.[2] Then, under the reduction, an occurrence of a variable w is bound if it is in a wfp of the form λw (the form of the *pure* bound variable); otherwise it is free. A wff (well-formed formula) is a wfp whose label is o, i.e. it is a, perhaps open, sentence.

Unlike Church but like Russell, and written English, we generally refrain from writing structural labels on wff(although it is sometimes handy to so index variables). Whenever required a *labelled* wfp can (like a phrase marker) be derived by adding labels, as determined recursively by the formation rules, to the components, e.g. as subscripts.

It is now easy to explain how it is that structure theory encapsulates Ajdukiewicz's theory so neatly. Ajdukiewicz's theory of syntactic connexion can be seen as consisting of two parts, a theory of concatenation of structure labelled expressions which is mirrored faithfully in structure theory[3] because of rule 2, and a further tentative theory – designed to cope with expressions containing operators – of circumflex operators and constants such

[1] Church uses ι instead of ϵ, but here $\imath$ is reserved for definite descriptions. However Church's ι, as it appears in Henkin's formulation, is not a definite description operator but none other than Hilbert's ϵ-operator, as Henkin's semantics at once reveals (cf. §22).

[2] This observation is due to S. Read. However the reduction while simplifying the syntax adds bound variable wfps of the form λw, for w with label α, and complicates the semantics.

[3] Though the concatenation of structure theory is different because of the way n-place functors are represented.

as π (with index $s/(s/n)$).[1] But the theory of circumflex functions sketched (which is based on Russell's use of the circumflex symbol in distinguishing functions from function values notationally) is none other than Church's theory of λ-conversion, with the rules of conversion clearly formulated (for the extensional case: Ajdukiewicz 1935, p. 229): and the further method of reducing quantifiers as operators to constants applied to circumflex expressions is exactly that Church adopts (in Church 1940). Though structure theory captures Ajdukiewicz's theory it in fact goes much further, in as much as it is already fully axiomatised in the two-valued extensional case by Church's theory.[2] The salient point however is that the morphology of structure theory or, what almost comes to the same, the grammar of Ajdukiewicz's full theory, provides a very general framework for logico-grammatical investigations to which a range of axiomatic and semantic systems can be geared.

It is worth exhibiting a little of the power of structure theory for the formalisation of discourse, before turning to its weaknesses and to its axiomatic enrichment. The theory provides a functorial grammar adequate as a base for the formalisation of substantial fragments of English discourse (as the work of Montague 1970a, Lewis 1970–71 and others indicates). For it not only includes quantifiers and descriptors; by providing a general theory of syntactic connexion it includes a ready-made theory of modifiers, of adverbs and attributive adjectives, in all their iterations and profusion; and Henkin's work once again furnishes a semantics in the easy two-valued extensional case.[3] Enlarged by constants to reflect operators and connectives of English, the applied theory constitutes a theory (of varying adequacy) of all parts of speech.[4] For example tenses can be included as verb

[1] This theory is not the only one Ajdukiewicz considers in order to deal with operator expressions, but his alternative is unsatisfactory. Furthermore he misses in his general argument on pp. 221–2 (which is accordingly flawed) an alternative to λ-theory which is now taken seriously, that of treating quantified phrases as general verbs.

[2] It goes further in other respects as well, e.g. it includes under the Church formulation quantification for every grammatical category – quantification that can however be satisfactorily interpreted substitutionally or in a truth-valued way in cases other than subject quantification.

[3] That Church's type theory provides a ready-made and attractive theory of modifiers was pointed out by M. K. Rennie. He convinced me that there was a worthwhile role for type theory after all (albeit a distinct role from the one he has elaborated in Rennie 1974). The many virtues of type theory as a theory of modifiers are brought out in his Rennie 1974. Structure labels such as π_k are taken therefrom.

[4] For should there be any parts of speech that cannot be derived functionally they can as a last resort be treated as further basic categories. This is not to gloss over the very substantial class of unsolved problems where transformations of some effective sort will have to be applied in the reduction to logical form, e.g. a prominent case is that of predicative adjectives following inert verbs such as "is", "looks", "grows", and "becomes".

modifiers, conjoined and disjoined subjects and predicates can be included simply by letting constants K and A, of conjunction and alternation, have, as well as structure labels ((oo)o), labels $((\iota\iota)\ \iota)$ for subject concatenation and $(((\mathrm{o}\ \iota)(\mathrm{o}\ \iota))(\mathrm{o}\ \iota))$ for predicates, and so on. Of course to obtain an axiomatic theory, postulates governing the connectives have also to be added, e.g. a lattice structure would be imposed in the case of compound subjects.

A crucial weakness of functorial grammars, from the point of view of natural language analysis, springs from the assignment of a single structure label to each expression. For instance a verb like "rides" may be treated as mapping a single subject to a sentence (i.e. it will have label $(\mathrm{o}\ \iota)$), or it can, in effect, map a pair of subjects to a sentence (i.e. it will have label $((\mathrm{o}\ \iota)\ \iota)$), but it cannot do, what "rides" does in English, both jobs, which depending on its sentence context. The same goes for adverbs and adjectives, and other derived parts of speech, where one and the same *unambiguous* English expression may, for example, map one or two or more place verbs onto the same and may also map other adverbs to adverbs and adjectives to adjectives (e.g. quietly, quickly, silently). This fundamental problem[1] can however be avoided (if not resolved) by allowing derived categories – not basic ones or effectiveness could be jeopardised – to have labels which may vary within specified limits. For example a predicate (general verb) can be characterised as an expression with structure label π_k – i.e. $(\ldots((\mathrm{o}\ \iota)\ \iota)\ldots\iota)$ with k occurrences of ι, for some k; and the verb "rides" would be assigned label π_k with k restricted to 1 or 2. Then in any given occurrence precisely which label "rides" has will be determined by its frame of occurrence. In short the problem may be circumvented by making the reduction of an English sentence to logical form *frame* (or context) *sensitive*. Since the reduction is frame sensitive the language being reduced has really to be assigned at least a frame-sensitive functorial grammar. The structure labels of expressions of derived grammatical categories are determined in a sentence frame by the expressions upon which they operate; for example "Tom rides Dobbin" is first recast in logical order as "((rides Tom) Dobbin)"; then since the whole is a sentence and "Tom" and "Dobbin" each have label ι,

[1] This is Rennie's description of the problem (in Rennie 1974). As he points out the problem appears to affect not only type theories but any theory, such as his theory of predicate modifiers based on quantification logic, which employs a set-theoretical semantics. The problem for quantification logic can however be escaped in semantic theories which are not set-theoretic; e.g. by building on a semantics like that of §§15–16 or that of Church 1956 for quantificational logic where predicates are simply assigned relations (not sets of ordered elements) which can reflect the varying adicity of the predicates they model.

π_k is resolved to π_2.[1] The sentence is not ambiguous and unlike ambiguous sentences has only one reduction.

A serious weakness of structure theory, insofar as it simply reinterprets type theory, is its extensionality. The worst features of Church's theory can be avoided, as is well-known, by simply omitting the axioms of extensionality. Nonetheless it remains essential to intensionalise the resulting structural logic; for although intensional discourse can be formally represented once extensionality axioms are omitted, its main logical and semantical features cannot be revealed, and many logical relations are either destroyed or have to be specially postulated. As R. Ackermann explains (Ackermann 1972, pp. 16–18), without intensionalisation even simple entailments such as that John believes that Tom is tall and Tom is thin entails that John believes that Tom is thin, and simple reference statements such as that John's beliefs are about the same person, cannot be accommodated. A crucial corresponding semantical reason for intensionalisation is that otherwise the semantic evaluation of compound expressions cannot be obtained from the evaluation of their components. A merely extensional logic with an extensional semantics is inadequate to deal with the effect of connectives and modifiers in expressions such as "necessarily $2 + 2 = 4$", "walks rapidly", and "possible president". For example in the case of "possible"

> one can find two common nouns ζ and η corresponding to the same set of individuals – or having as we should ordinarily say, the same extension (with respect to the actual world and the standard model) – but such that "possible ζ" and "possible η" have different extensions. (Montague 1970b, p. 220).

[1] There will be corresponding semantic ado about obtaining the correct relations between "rides" with label π_1 and "rides" with label π_2. Moreover the method opens the way to other problems. Thus if "rides" is the same in such sentences as "Tom rides", "Tom rides every day", "Tom rides Dobbin" and "Tom rides Dobbin every day", then such sentences as

Tom rides and in fact Tom always rides Dobbin

should be open to quantification to yield

For some f, Tom f and in fact Tom always f Dobbin,

something that type theory proper certainly excludes. But there is no reason why quotational (generalised substitutional) quantification, in this case for predicates of variable adicity and read "for some predicate qu(f)", should not be invoked. Whether the type-theoretic restriction is mandatory or not depends on how the logical paradoxes are to be formally averted, and this depends on features of the axiomatisation, in particular on substitution principles. In contrast the set-theoretic paradoxes need cause little concern; for set theory can be axiomatised using the constant $\in$ with label $((\mathrm{o}\ \iota)\ \iota)$ along standard lines.

An immediate outcome of the compounding requirement is that modalisation alone is inadequate. For there are many connectives and modifiers, e.g. "Tom believes (that)", "it is interesting (that)", "allegedly" for which substitution or interchange conditions are stronger than modal, i.e. than intersubstitutivity of strict equivalence of some brand – with the result that functionality once again breaks down if only intensionality of modal strength is required. By basing the theory not on a modal logic but on a relevant logic, this problem can be substantially reduced.[1]

The business of intensionalising structure theory is unproblematic, at least as far as the logical syntax is concerned. We add an implication F with structure label ((oo)o) and define $(A \to B)$ as $((FA)B)$ where A and B are wff; thus $(A \to B)$ is a wff. Replace the axioms, 1–4 of Henkin 1950, for classical two-valued logic, by a set of axioms (without structure labels attached) for entailment (e.g. any set from RLR), the quantificational axioms, 5^{α}–6^{α}, by a set of axioms for quantification with entailment (as set out in §23). Abandon, most certainly, axioms 10, of extensionality. Replace "$\supset$" in the ϵ-axiom, 11, and the rule of detachment, V, by "$\to$". Otherwise the revamped Church system is kept; e.g. the rules for substitution and λ-conversion remain as formulated in Church 1950, though it now follows of course that $(\lambda x A(x))(y) \leftrightarrow A(y)$, and weaker equivalences no longer guarantee their intersubstitutivity. In fact however, the postulates can be drastically chopped, since the whole quantificational structure and rule VI may be derived using the ϵ-axiom

11. $A(x) \to A(\epsilon A)$, where A has label (oα) and x label α, for any α,

But designing an adequate semantics for such an intensionalised structure theory is by no means so unproblematic (as already observed in §23).

The intensionalising of structure theory is only the first of a series of desired improvements. The next step of making the theory into a significance theory is easy when the starting theory is extensional structure theory; the axioms (of reinterpreted type theory) are simply replaced by those from systems QS_6 and QSE of Slog, Chapter 7. But the matter of amalgamating significance and intensional enlargements is not so easy

[1] See RLR, chapter 7ff. Problems as to exactly which substitution conditions obtain for ultramodal functors, and how functors of more than entailment strength can be accommodated, are discussed briefly in Slog, 7.2, and further in RLR. The important case of *belief* is dealt with below (especially in chapter 8 [see Vol. 3 —*Eds.*]).

and much work remains to be done, as also in the conversion of these logics into context logics (along the lines laid out in Slog, Chapter 2).

As in the syntactical case, so also in the semantical case, though the framework for general semantics has been progressively and strikingly enlarged since the early pioneering days, the main modern framework is still too austerely fashioned, in several important respects which severely limit its adequacy for the analysis of discourse and in providing a background setting for philosophical problems; namely, through

(a) the restriction to possible worlds,

(b) the restriction to possible individuals,

(c) the restriction to an underlying two-valued (and usually first-order) account,

(d) the meagre role, if any, assigned to context.

Each of these restrictions can, as we have begun to see, be removed, (a) by the inclusion of impossible and incomplete worlds and theories, (b) by the inclusion of inconsistent, incomplete and indeterminate items, whether individual or not (thus (b) generalises on (a)), (c) by enlarging the number of values, and (d) by using context-supplied functions in semantical evaluations. Moreover the admission of more of discourse forces the abandonment of these restrictions, e.g. the admission of belief and entailment functors forces the abandonment of (a), and the general admission of singular descriptions, which has been strenuously advocated, compels the abandonment of (b), since some descriptions are not about possible individuals but are about items which are impossible. Naturally these desirable extensions of the semantical framework bring in their turn many new problems, some of them technical, such as the amalgamation of theories designed to surmount just one of the restrictions, and some of them philosophical.

There are two main and now very familiar reasons why these philosophical problems arise. Firstly, philosophers mistakenly committed to the Ontological Assumption that what they talk about must exist, are reluctant, to say the least, to talk about inconsistent or incomplete items, which of course do not exist; and hence are loath to use the enlarged semantical framework. Philosophy has generally – as part of the prejudice in favour of the actual – been opposed to indefiniteness, to the indeterminacy and ill-roundedness of objects: only inconsistency is considered worse. Secondly, the enlarged semantical framework is not only open to rival (metaphysical) construals, but is rich

enough to incorporate views of rival philosophical positions. This emerges especially in that supposed paradigm of philosophical neutrality, the theory of truth. Each formal philosophical theory, each different theory of descriptions for example, will fashion its own theory of truth, and philosophical disputes will be reflected in different truth-values assigned and equivalences admitted, e.g. for sentences containing non-denoting descriptions. (Admittedly many – not those which disagree about what can be true or false, and not all many-valued theories – will lead, for some class of sentences, to versions of Tarski's convention T, but even these theories will disagree about what count as equivalent reformulations of the convention.) There will also be dispute about the formulation of the theory of truth, whether it should be model-theoretic, domainless or merely substitutional, about the relation of the metatheory to the object language, about the point of extensionality and the extent to which it is mandatory, and so forth. In short, the semantics, and the theory of truth it incorporates, cannot hope to be very philosophically neutral, and cannot in general offer any resolution of philosophical issues but only, what is nonetheless very important, a sharpening and reformulation of them. One reason for interest in the wider semantical framework, connected naturally enough with its importance in supplying a semantics for much more of discourse, is that it promises to supply a unified semantics for, and a generalised framework for, the theory of objects.

To develop the very general semantical theory sought, one important and difficult preliminary problem consists in characterising (natural and suitably recursive) languages with sufficient generality, and ideally in a way linkable with complete generality if a truly universal semantics is to be attained. The preliminary task is first addressed.

Hitherto the approach has been rather piecemeal and partist, the aim being to approximate the full theory sought (which includes that of objects) from below by incremental steps. Now the approach is very general and more holistic although remaining analytic, and the aim is to approximate the full theory from above, by specialisation and the addition of detail to the general theory. The results of approximation from above and below can, with suitable adjustment, be valuably combined, and in this way the theory better defined.

1. *A canonical form for natural languages such as English is provided by λ-categorial languages? Problems and some initial solutions*. There are several conditions which the canonical language should meet:

(i) It should contain declarative sentences and a full range of intensional connectives. Though it is taken as a defining feature of languages that they consist of sentences, for such purposes as context assessment one may need to consider larger units of discourse such as paragraphs.

(ii) It should contain variables and variable binding devices and permit the characterisation of quantifiers, descriptors and analogous devices. It is for this reason that pure categorial languages, which lack these variable binding devices, are inadequate.

It can be correctly assumed, however, that every variable binding operation, such as those of quantification, can be separated upon analysis into two components: namely firstly a variable binding component which can be represented by something like Church's lambda abstraction, and secondly a constant operation (like a sentential function) on the resulting bound expression; e.g. $(x)A$ is represented by $\Pi(\lambda x A)$ where Π is a constant. In short, every variable binding operation such as quantification and description can be represented in the style of Church's type-theory of Church 1940.

A predicate system, or even a standard type system, enriched by arbitrarily many connectives, descriptions and quantifiers is nonetheless inadequate. The inability of such systems to treat adjectives and adverbs adequately is their first conspicuous inadequacy (see e.g. Rennie 1974). The problem can be largely resolved, as just explained, by adopting a structural language with a functional or categorial logic, thus enabling a third condition of adequacy to be met, namely that

(iii) the language should facilitate the treatment of such parts of speech as adverbs and adjectives, and indeed should enable all traditional parts of speech to be encompassed.

Given that

(iv) the canonical language should be exact and recursively structured like a logical system,

conditions (i)–(iii) virtually force the adoption of something at least as powerful as a λ-categorial or Church type-theoretic language. Thus such a language appears to be *minimal* in meeting canonical language requirements; anything weaker, such as applied quantificational logic, would be inadequate.

At the same time a λ-categorial language meets requirements on a canonical language that have commonly been considered *desirable* (cf. Montague 1970a and Cresswell 1973 both building on arguments of Chomsky):

(v) It should be unambiguous. As a minimum condition no expression should belong to more than one syntactic category (or type). This condition strictly construed, enforces the functional character of a canonical language: otherwise ambiguities could arise in phrase construction (cf. Montague's *disambiguated* languages of Montague 1970a). For categorial languages, which meet this condition, it is a source both of strength (because of the tectonics: it makes the canonical grammar simple, elegant, flexible, and closely aligned with semantics) and of weakness (because certain constructions appear initially to be excluded).

(vi) It should be grounded, i.e. the grammar should be built up from a set of basic categories which are not further analysed. There are no infinite descending chains or circles in analysis so that somewhere no bottom categories are reached; thus there will be basic syntactic categories.

(vii) It should be appropriately finitary. In particular sentences should be of finite length only, and each basic grammatical category should contain only finitely many constants.

The fact that categorial languages meet conditions (i)–(vii) does not of course show that they are adequate, and it is not obvious that they are adequate. It is evident, however, from much recent work that λ-categorial languages can go a very long way in furnishing a canonical form for English, in encompassing without much further ado virtually the whole range of parts of speech of English, and that there are ways around most so far observed shortcomings of these languages as canonical structures.

Nonetheless λ-categorial languages, though they include most present-day formal systems, are by no means the most general forms of languages; for they exclude phrase structure languages which are context-sensitive, and thereby many languages of linguistic and computational interest, and they exclude concatenation, and thereby Post-style languages built up in a simple way using concatenation. The omission of concatenation itself is easily rectified by adding an improper (untyped) symbol "$\frown$",with a status similar to that of parentheses, and defining *strings* thus: a symbol A alone is a string; and if A and B are strings so is $\widehat{AB}$. However strings are not *well-formed* phrases (wfp) of a

λ-categorial language, but only correspond in certain cases to wfp, and without modification (freeing) of the language the class of well-formed formulae is fixed so as to exclude sets of strings which may be grammatically admissible.

Since λ-categorial languages are far from completely general among formal languages that provide recursive grammars, their adequacy as deep structures for natural languages will have to be defended differently, as being adequate when coupled with transformations (see 6 below), and on somewhat more empirico-pragmatic grounds, crudely that they will do the job. There are two main classes of objections to the hypothesis that λ-categorial languages are adequate, namely:

(i) *Excessive width*: they would admit as well-formed (grammatical) sentences which are not. To meet this criticism Cresswell 1973, p. 224 appeals to (unspecified) acceptability principles. An alternative, here favoured (for reasons given in Slog, especially chapter 4), is to appeal to a significance filter; that is, the canonical language generates as grammatical both significant and non-significant sentences, and a significance theory then filters out the non-significant sentences. The main result (I) below in no way upsets, but facilitates, this position; for if every logic on a λ-categorial language has a two-valued worlds semantics then ipso facto it has a three-valued (significance) semantics, and the significant sentences, i.e. the class of sentences A for which GA on an appropriate significance functor "G", can be isolated (see 6 below).

(ii) *Excessive narrowness*: they would exclude as ill-formed sentences that are not. A classic example is provided by adjectives (the "problem" of predicative adjectives). Attributive adjectives are readily handled in categorial languages: they map common nouns, with syntactic category label 2 say, to common nouns, and hence they have type label (22). Such adjectives also function however, *without ambiguity* it would seem, as predicative adjectives. But to combine with the verb "is" which maps a pair of subjects to sentences and accordingly has type label $0(1,1)$ an adjective used predicatively would have to have label 1, not label (22), yet the functional character of categorial languages precludes a part of speech from carrying dual type labels. The problem can only be met within λ-categorial languages by transforming predicative occurrences of adjectives so that they do not figure in deep structure, and the obvious strategy is to transform the occurrences into attributive cases. This can be done by generalising *one*-insertion which operates thus:

> "... is f", where "f" is an adjective, becomes "... is an f one"; e.g. "That flea is large" transforms to "That flea is a large one".

A generalised *one*, which occurs in deep structure only, is needed to cope with subjects like "the heat" or "the dust". Of course "One what?" has still to be specified in sentences like "Tom is a big one"; but this specification can be supplied by the context (see Cresswell 1973, pp. 184–5, and also Slog: the important issue of context will be taken up again in 7).

That there is scope for insertions in the transformations from surface English structure to canonical form (and correspondingly for deletions in the inverse transformation) means that so long as no bounds are imposed on the class of insertions *any* apparently relational features of surface grammar can be removed in favour of functional features of canonical form by the introduction in the transformation of further appropriate distinguishing factors reducing relations to functions (cf. 6). For this reason too it is difficult to test or falsify the hypothesis that the deep structure of English is λ-categorial.

The same strategy – insertion in transforming to canonical form – may be applied in an attempt to surmount the fundamental problem (already remarked) of using a formal language as canonical language. Rennie provides an excellent account of the fundamental problem of modifier theory – that

> English the same modifier can modify predicates of different adicity and the problem is to find what connections there are between a modifier's operations in different cases (Rennie 1974, p. 62);

but the same problem already arises for English predicates, e.g. "worry" and Montague's "walks", and arises elsewhere, e.g. strikingly in the case of quotation operations which form subjects from any string. As explained, type labels may be added in the course of transformation to canonical form, or variable labels pinned down, the resulting particular label depending on the sentence context, i.e., the reduction to deep structure is sentence context sensitive. This does not imply that the surface structure need be ambiguous (though the endemic problem of type-theoretical logical bases is that of locating ambiguities where there are none); the specification of variable or open labels need not be counted as a case of ambiguity, in contrast to other notations, e.g. different labels attaching to various occurrences of "bank", which do reflect ambiguity.

This way of grappling with the fundamental problem is, however, none too satisfactory. A superior alternative, which gives all the advantages of the variable label method, is to free primitive expressions from their association with a single fixed label, and to allow them to have a multiplicity of structural labels. This relaxation of type-theoretical conditions, which leads to *free* λ-categorial languages, is investigated shortly.

In conclusion, not only are (free) λ-categorial languages extremely promising (though not unique) candidates as canonical languages for natural language analysis, but it is not going to be a straightforward matter finding decisive counterexamples which bring them down. It is with *some* confidence then that we can turn to the formal semantics of (free) λ-categorial languages as providing a basis for semantics for English and other natural languages.

2. *Description of the λ-categorial language L.* As well as the main language L described, which is but a simple extension of Church's simple type theory Church 1940 to include (as in Kemeny 1948) several types, a variant though equivalent form L', essentially the language used by Ajdukiewicz 1935 and Cresswell 1973, is described.

A. *Structure Labels, i.e. Syntactic Categories*

(1) Each of $0, 1, 2, \ldots, m$ for some (natural) number $m \geq 0$ is a structural label.

(2) If α and β are structure labels so is $(\alpha\beta)$.

Let $\mathrm{FNat}_m = \{0, 1, \ldots, m\}$. The class Syn of structure labels or syntactic categories is defined, in the usual finite case, as the smallest class satisfying

(1) $\mathrm{FNat}_m \subseteq \mathrm{Syn}$

(2) If α,$\beta \in \mathrm{Syn}$ then $(\alpha\beta) \in \mathrm{Syn}$.

In the Ajdukiewicz–Cresswell form (2) is replaced by the more elaborate rule

(2′) If α,$\beta_1, \ldots, \beta_n \in \mathrm{Syn}$ then $\alpha(\beta_1, \ldots, \beta_n) \in \mathrm{Syn}$.

In the Church–Henkin form the effect of (2′) is got by iteration of (2), i.e. $\alpha(\beta_1, \ldots, \beta_n)$ is represented by $(\ldots((\alpha\beta_1)\beta_2)\ldots\beta_n)$.

B. *Symbols (Primitive symbols)*

(1) Denumerably-many variables or parameters, for each structure label α: x, y, z, f, g, x', y', ...

(2) Finitely-many constants, each with some one structure label α: C, D, Q, a, b, $C(1)$, $D(1)$, ...

(3) Improper symbols: λ, (,).

Thus each proper symbol A has a unique structure label α associated with it. No division of constants into logical and extralogical constants is required. Thereby one of the main sources of criticism of previous semantical theories is avoided.

Alternatively the proper symbols may be specified by functions Con and Var defined on Syn, as in Cresswell 1973. Then Con_α is the finite class of constants with label α, and Var_α is the denumerable class of variables with label α. Con_α is null for all but finitely many α. Parentheses are convenient but not unavoidable. The presence of λ (and variables) is what distinguishes a λ-categorial language from a (pure) categorial language.

C. *Well-Formed Phrases (wfp; Expressions)*

(1) A variable or constant alone is a wfp with structure label as specified, i.e. where B_α is a variable with label α (written: B_α is a variable for short) it is a wfp with label α, and where A_α is a constant it is a wfp with label α.

(2) If E and F are wfp with structure labels $(\alpha\beta)$ and β respectively then (EF) is a wfp with structure label α.

In the Ajdukiewicz–Cresswell form (2) is replaced by

(2) If $E_1, \ldots, E_n$, F are wfp with respective structure labels $\alpha_1, \ldots, \alpha_n$, $\beta(\alpha_1, \ldots, \alpha_n)$ then $F(E_1, \ldots, E_n)$ is a wfp with structure label β.

(3) If E is a wfp with structure label α and w is a variable with label β then $(\lambda w E)$ is a wfp with label $(\alpha\beta)$.

(A many variable version (3′), also possible, would chime in better with the Ajdukiewicz–Cresswell form, but has never in fact been used.) Rules (1)–(3) specify the class wfp. Structure labels are simply *associated with* wfp; but it is convenient in what follows to subscript a wfp by its associated label in the fashion of some type theories. An occurrence of a variable w is bound if it is in a wfp of the form $(\lambda w E)$; otherwise the occurrence is free.

A *(declarative) wff* is a wfp with label 0. A (declarative) *sentence* is a closed wff, i.e. one with no free variables. The question as to whether imperative and interrogative sentences have label 0 or even occur can be left open. (In a wider classification one might have: a *declarative* wffis a wfp with label 0; an *imperative* wffis a wfp with label 3; an *interrogative* wffis a wfp with label 4, etc.) In a language with subject-predicate forms a subject is a wfp with label 1. It is not essential however for the present analysis that sentences have subjects. What is essential for a semantical analysis by way of a truth definition is that a class of declarative sentences which are bearers of truth-values be included.

A λ-categorial language is represented then by a structure $\langle \mathrm{FNat}_m, \mathrm{Syn}, \mathrm{Var}, \mathrm{Con}, \mathrm{Wfp}, \mathrm{O}, \Lambda \rangle$, and a *categorial* language is represented by a similar structure but without symbol λ. Conversely λ-categorial languages can be embedded in categorial languages with a suitable constant $\lambda_{\alpha\beta\alpha\beta}$.

The finiteness restrictions, to finitely-many syntactic categories and to finitely-many constants, are quite inessential in what follows and can be removed. The same applies to denumerability restrictions. Thus the categorial languages considered include all the disambiguated languages of Montague's universal grammar of Montague 1970a, and, insofar as Montague's universal grammar is universal, so also will the semantics given be universal.

3. *Logics on language L.* A language L may have one or more logics associated with it. Whether a language has an *intrinsic* logic or a *unique* logic associated with it, e.g. a class of analytic truths, can be left open. But it is evident that languages generally have a multiplicity of associated logics.

One of the theses to be established is that *every logic* associated with or *on L has a two-valued worlds semantics.* It will suffice to show that a sufficiently representative arbitrarily selected logic S on L has such a semantics.

It can be supposed, without important loss of generality, that S can be represented by a pair $\langle \mathcal{H}, \mathcal{R} \rangle$ where $\mathcal{H}$ is a (countable) set of axioms and $\mathcal{R}$ is a (countable) set of derivation rules of the form: where $A_1, \ldots, A_n$ are theorems so is B, i.e. $A_1, \ldots, A_n \rightarrowtail B$ for short. Proof and theoremhood can be defined in much the usual way.

Providing a Tarski–Montague semantics for a language then becomes a special case of providing a semantics for a logic S on L. It consists of that special case where the truths expressible in the language are taken as axioms and the rules (*if any*) do not enlarge on the class, e.g. if some rule is required it can be just repetition: $A \rightarrowtail A$, or say the rules of variable change and λ-conversion. Call such a logic the *truth-logic*. Then the (basic) *semantics of a language* is the truth-logic on L.

It is assumed that λ-categorial logics, i.e. logics on λ-categorial languages, bring out the basic logical features of λ-conversion. To achieve this objective it is advantageous to have as well as "λ" some further logical constant; the cheapest solution appears to be that adopted, of taking a structural identity connection, $\equiv$, as fundamental. A similar solution is adopted in Cresswell 1973, p. 88ff., where a relation "conv" of conversion, tantamount to "$\equiv$", is introduced. The constant $\equiv$, which satisfies Leibnitz identity conditions, behaves very like a synonymy link. The connection is essential in representing logically transformations and derivations in deep structure which exhibit sameness of deep structure (it is for this reason that $\equiv$ is dubbed "structural identity").

Where the logic of λ-conversion is not, however, required both the logic of λ and the associated logic of $\equiv$ can be dropped, as will emerge. That is, categorial languages need not meet any common logical constraints.

A. *The Basic λ-Categorial Logic B*

Logic B contains the specific constant Q with label $(o\alpha)\alpha$ (for any structure label α). A structural identity connective $\equiv$ is then defined:

$$(A_\alpha \equiv B_\alpha) =_{\mathrm{Df}} (((Q_{(o\alpha)\alpha})A_\alpha)B_\alpha)$$

B has as postulates just the principles of Leibnitz identity and λ-conversion. (The postulates generalise those of Routley and Meyer 1976 for austere equivalence.)

B. *Axiom Schemes*

A1. $A_\alpha \equiv A_\alpha$

A2. $((\lambda x_\gamma A_\beta)B_\gamma) \equiv S^{x_\gamma}_{B_\gamma}(A_\beta)|$

i.e. $\equiv A_\beta[B_\gamma/x_\gamma]$,

i.e. the wfp which results from A_β by substituting B_γ for x_γ throughout A_β, provided that the bound variables of A_β are distinct both from x_γ and the free variables of B_γ. (λ-conversion)

Alternatively A2 may be replaced by rules of λ-conversion, that is, rules (II) and (III) of Henkin 1950 (i.e. rule RC of 6).

C. *Rules*

R1. Where A_o and $A_\mathrm{o} \equiv B_\mathrm{o}$ are theorems, so is B_o; i.e. A_o, $A_\mathrm{o} \equiv B_\mathrm{o} \rightarrowtail B_\mathrm{o}$.
(Structure detachment).

R2. Where D_β results from C_β by substitution of B_γ for A_γ in one occurrence (derivatively, zero or more occurrences) in C, and $x^{(1)}_{\alpha_1}, \ldots, x^{(n)}_{\alpha_n}$ include all the free variables of A_γ and B_γ which also occur as bound variables of C_β, then if $A_\gamma \equiv B_\gamma$ is a theorem for every $x^{(1)}_{\alpha_1}, \ldots, x^{(n)}_{\alpha_n}$, so is $C_\beta \equiv D_\beta$.
(Substitutivity of equivalents).

R3. Where x_γ is a variable which is not free in C_β, y_γ is a variable which does not occur in C_β, and B_o results from A_o by substituting $S^{x_\gamma}_{y_\gamma} C_\beta|$ for a particular occurrence of C_β in A_o, then, if A_o is a theorem, so is B_o.
(Bound variable change).

The *logics* S considered are, to begin with, *all* extensions of B obtained by adding axioms or rules; but subsequently it will be shown how the restriction to extensions of B can be appropriately qualified and indeed removed entirely in the case of categorial languages. Among the logics considered are the λ-closed sets of sentences of Cresswell 1973.

The metalogic MS of logic S on L will be that discussed in Rennie 1974, pp. 75–6, (or Tichý 1971, pp. 283–5) – save that the set $\{0, 1, \ldots, m\}$ replaces $\{\mathrm{o}, \iota\}$ and the class of formulae is correspondingly enlarged and that the neutral quantificational notation is adopted – together with a fragment of English. The semantics for S will however be entirely representable in the type enlargement *MS* of Rennie's logic without English. Specifically, the formalism of *MS* differs from the type theory of Henkin 1950, apart from purely notational changes, *only* in replacing Henkin's rule I for type symbols by the rule:

$0, 1, \ldots, m, \kappa$ are type symbols.

κ is the world label of Rennie, and D_κ the set of worlds. Rennie's argument, effectively that *MS* is an extensional logic, can be filled out formally by appeal to Carnap's characterisations of extensional languages and systems (as given, e.g. in MN). The extensionality of *MS* may then be proved using the results of Henkin 1950, p. 56. The importance of the extensionality of *MS* will emerge when Carnap's thesis of extensionality is proved for all languages and systems expressible in L.

4. *The semantical framework for a logic S on L.* A *basic S-model* is a structure $M = \langle T, K, D, \nabla, v\rangle$, where K is a set (of worlds); T (the base world) is an element of K; D and ∇ are functions from structure labels, i.e. defined on Syn, whose values are non-null sets, and v is a valuation function which assigns values to each variable and each constant of L. D, ∇ and v are specified in more detail as follows:

$D_o = 2 = \{1, 0\}$; for $1 \leq j \leq m$, D_j is an arbitrary set (e.g. on standard accounts D_1 is the set of rigid subjects or pure individuals); then $D_{\alpha\beta}$ is defined as the class of functions from D_β into D_α.[1]

For $0 \leq j \leq m$, $\mathcal{D}_j = D_j^K$; otherwise $\mathcal{D}_{\alpha\beta}$ is the class of functions from $\mathcal{D}_\beta$ into $\mathcal{D}_\alpha$. The members of $\mathcal{D}_o$, maps from K to $\{1, 0\}$, are assertions; they correspond 1–1 to LA-propositions or ranges, classes of elements of K.[α]

Function v assigns thus:

$v1$. to each initial variable A with label α an element ($\rho_{\alpha\kappa}$ say) of $\mathcal{D}_\alpha$, i.e. $v(A_\alpha) \in \mathcal{D}_\alpha$.

$v2$. to each initial constant A with label α a relation $\mathcal{R}^A_{\kappa[\alpha]}$, i.e. $v(A_\alpha) = \mathcal{R}^A_{\kappa[\alpha]}$. For a genuine constant the relation will be subject to constraints.

The κ-transform $\kappa[\alpha]$ of label α is defined inductively as follows:

(1) If $\alpha = j$ for $0 \leq j \leq m$ then $\kappa[\alpha] = (j\kappa)$; and

(2) If α is of the form $(\beta\gamma)$, $\kappa[\alpha] = (\kappa[\beta]\ \kappa[\gamma])$.

In short, the κ-transform results by replacing each basic category label j by $(j\kappa)$ throughout α. A similar transform is used by Bressan 1972, p. 12.

∇ satisfies the following conditions:

[1] Since a rigid semantics will work, *ipso facto* a semantics which allows for world by world variation of subject signification will work. Rigidity involves no loss of generality.

[α] An LA-proposition expressed by a wff A is $[A]$, i.e. $\{a \in K : I(A, a) = 1\}$, sometimes simply called the "proposition" expressed by A. —*Eds.*

∇i. $v(A_j) \in \nabla_j \subseteq \mathcal{D}_j$, for every wfp A_j, $0 \leq j \leq m$.

∇ii. $\nabla_{\alpha\beta} \subseteq \nabla_\alpha^{\nabla_\beta}$

∇iii. $v(A_\alpha) \in \nabla_\alpha$, for each initial variable or constant A_α of L.

Lemma 1. $\nabla_\beta \subseteq \mathcal{D}_\beta$, *for each* β. (Proof is by induction on $\mathcal{D}_\beta$.)

In case $Q_{(o\alpha)\alpha}$ satisfies the postulates of logic B, there remains one condition on $T = v(Q_{(o\alpha)\alpha})$ where T has label $((o\kappa)(\alpha\kappa))(\alpha\kappa)$, namely

T1. $\mathcal{T}\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$ iff $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$.

An *interpretation* I, of S, associated with valuation v is a function defined on wfp satisfying, quite generally, the following conditions:

Ii. $I(A_\alpha) = v(A_\alpha)$, for each initial variable A_α;

Iii. $I(A_\delta) = \mathcal{R}^A_{\kappa[\delta]}$, for each initial constant A_δ of L.

More explicitly, where $\delta = (\ldots((\beta_1\alpha_1)\alpha)\ldots\alpha_n)$ with β_1 a basic component in the constant A_δ (i.e. β_1 is not analysed in the logic of A_δ) and where $\rho_i \in \nabla_{\alpha_i}$ for $1 \leq i \leq n$,

$$I(A_\delta) = \lambda\rho_1 \ldots \lambda\rho_n \; \lambda\alpha_\kappa \mathcal{R}^A_{\kappa[\delta]} \; \rho_1 \ldots \rho_n \alpha_\kappa$$

Iiii. Where A_δ has the form $B_{\alpha\beta}C_\beta$, i.e. $A_\delta = A_\alpha$,

$$I(A_\delta) = I(B_{\alpha\beta}C_\beta) = I(B_{\alpha\beta})(I(C_\beta)),$$

i.e. $I(B_{\alpha\beta}C_\beta)$ is the value of the function $I(B_{\alpha\beta})$ for the argument $I(C_\beta)$.

Iiv. Where A_δ has the form $(\lambda w_\beta B_\gamma)$, $I(\lambda w_\beta B_\gamma)$ is that function whose value for the argument ρ of ∇_β is $I'(B_\gamma)$, where I' is that w_β-variant of I for which $I'(w_\beta) = \rho$, i.e. I' agrees with I on all initial assignments except at w_β where $I'(w_\beta) = v'(w_\beta) = \rho$.

It is evident that the function D can be eliminated from basic S-models, i.e. basic S-models can be represented adequately, as far as the semantics goes, by structures $\langle T, K, \nabla, v\rangle$.

Lemma 2. $I(A_\alpha) \in \nabla_\alpha$, *for each wfp* A_α *of* L.

Proof is by induction on the construction of A_α. The basis for wfp $I(A_j)$ is immediate from ∇i. For the induction it is assumed that the hypothesis has been established to a given stage in wfp construction both for I *and* for its variants. Then Iiii and Iiv follow using ∇ii, and Iii using ∇iii.

For each postulate of logic S a corresponding semantical condition is imposed on the modellings of S. A translation sp is defined translating syntactical schemes into semantical schemes. The postulates added in the case of the theory of items will naturally be those introduced in previous sections.

A *translation* $\mathrm{sp}(A)$ of wfp A with respect to model M is an interpretation sp on M. The function sp is defined recursively, from a given initial clause, for every wfp in a way paralleling the definition of interpretation on I in M; thus:

$\mathrm{sp}(A_\alpha) = \rho$ with $\rho \in \mathcal{D}_\alpha$, for each initial variable A_α;

$\mathrm{sp}(A_\delta) = \mathcal{R}^A_{\kappa[\delta]}$, for each initial constant A_δ;

$\mathrm{sp}(B_{\alpha\beta}C_\beta) = \mathrm{sp}(B_{\alpha\beta})\,\mathrm{sp}(C_\beta)$;

$\mathrm{sp}(\lambda w_\beta B_\gamma) = \lambda\rho\,\mathrm{sp}'(B_\gamma)$, where sp' differs from sp on initial assignments only at w_β and $\mathrm{sp}'(w_\beta) = \rho \in \nabla_\beta$.

It will simplify work to take the translation $\mathrm{sp}(A)$ of wfp A with respect to M to be simply its interpretation with respect to M, i.e. $\mathrm{sp}(A_\alpha) = I(A_\alpha)$ for every (initial) wfp A_α.

Where A is an axiom of S and $\alpha = \mathrm{sp}(A)$, the *semantical postulate for* (corresponding to) axiom A is $\alpha(T) = 1$. Similarly where $\alpha_1 = \mathrm{sp}(A_1), \ldots, \alpha_n = \mathrm{sp}(A_n)$, $\beta = \mathrm{sp}(B)$, the semantical postulate for the rule: $A_1, \ldots, A_n \rightarrowtail B$ is:

if $\alpha_1(T) = 1$ and $\ldots$ and $\alpha_n(T) = 1$ then $\beta(T) = 1$.

The provisos on rules and axiom schemes translate into provisos on corresponding semantical postulates. The adequacy of the method of representing rules, which is not obvious but will be established, turns on the fact that world T just is the set of theorems of S. That the method works helps account for the twisted character of the general semantics given.

The semantics given is basically (an elaboration of) that version of the "neighbourhood" semantics called by Hansson and Gärdenfors 1973 "the 'f' version". It is isomorphic to the neighbourhood semantics used in Routley and Meyer 1976, differing only in the placement of label κ. For example, whereas the neighbourhood semantics assigns to a one-place connective $\Box_{(o o)}$ a relation $\mathcal{R}_{o(o\kappa)\kappa}$, the "$f$"-version assigns relation $\mathcal{R}_{(o\kappa)(o\kappa)}$ (cf. Rennie 1974, p. 81); and they assign respectively to n-place connectives $C_{((oo)\ldots o)}$ relations $\mathcal{R}_{:(o(o\kappa))\ldots(o\kappa)\kappa}$ and $\mathcal{R}_{:(o\kappa)(o\kappa)\ldots(o\kappa)}$. Either semantics could be used; they are isomorphic semantics. The "f"-version was selected because it fits in with κ-transformation a little more easily; the neighbourhood semantics would require as well a κ-displacement in defining the relations assigned to constants. The adoption of the "f"-version apparently however trivialises the translation of syntactic schemes into semantical postulates. But the uniform semantics are neither more nor less trivial than those given for sentential and quantification logics elsewhere; these semantics only appear deeper because the formal semantics differ by a further less obvious transformation from the syntax they model.

It is unnecessary to appeal to a neighbourhood, or "second-order", semantics in order to supply a universal semantics. A parallel"first-order" semantics can be given as ER shows; only such a theory is even more "twisted", i.e. interpretation rules even further removed from the natural ones.[1]

An *S-model* M for logic S on L is a basic S-model M which conforms to the semantical postulates for the axioms and rules of S (beyond those of logic B).

> A wff A holds at world a in S-model M iff $I(A)(a) = 1$; A is *true* in M iff A holds at T and *false* in M otherwise and M is a countermodel to A. W ff$A$ is S-valid iff A is true in every S-model, and S-invalid otherwise.

It is extremely important that additional postulates be admitted in an unrestricted way (and not because the logics would be of less interest otherwise). For the syntactical constraints on a constant and the corresponding semantical requirements on its relation are what distinguish a constant from others of the same grammatical sort; and it is *this* way that the distinctive meanings of categorically similar constants is captured, namely through stacks of constraints which reflect its truth-conditions in all sentence frames.

[1] ER as presented concerns extensional reduction. But it could readily be re-presented as showing *referential reduction* of any theory.

5. *The soundness and completeness of S on L.*

Theorem 1. *For any logic S on L and any wff A, if A is a theorem of S then A is S-valid.*

Proof is by induction over the length of the proof of A.

ad A1. Since by a lemma $I(A_\alpha) \in \nabla_\alpha$, and $I(A_\alpha) = I(A_\alpha)$ for an arbitrary S-model M, $\mathcal{T}I(A_\alpha)\, I(A_\alpha)(T) = 1$ by T1. But $I(Q_{(o\alpha)\alpha}) = \mathcal{T}$, whence $I(A_\alpha \equiv A_\alpha)(T) = 1$, i.e. (A1) is true in M.

ad A2. For arbitrary S-model M,

$$\begin{aligned} I((\lambda x_\gamma A_\beta)B_\gamma) &= I(\lambda x_\gamma A) I(B_\gamma) \\ &= I'(A_\beta), \end{aligned}$$

where I' is that x_γ-variant of I for which $I'(x_\gamma) = I(B_\gamma) \in \nabla_\gamma$. However $I(A_\beta[B_\gamma/x_\gamma]) = I'(A_\beta)$ where I' is as before. Hence $I((\lambda x_\gamma A_\beta)B_\gamma) = I(A_\beta[B_\gamma/x_\gamma])$. That A2 is true in M now follows as in the case of A1.

ad additional axioms of S. Suppose wff A is an axiom of S. Then for an arbitrary S-model M, the semantical postulate $I(A)(T) = 1$ holds; hence A is true in M.

ad R1. Suppose for arbitrary S-model M, $I(A_o)(T) = 1 = I(A_o \equiv B_o)(T)$.

By T1, $I(A_o) = I(B_o)$, whence $I(B_o)(T) = 1$ as required.

ad R2. Suppose for arbitrary S-model M, $I(A_\gamma \equiv B_\gamma)(T) = 1$ for every assignment in $x^{(1)}_{\alpha_1}, \ldots, x^{(n)}_{\alpha_n}$. By T1, $I(A_\gamma) = I(B_\gamma)$, for every assignment to the given variables. Then $I(C_\beta) = I(D_\beta)$ (by the quantificational semantical metalogic), whence as in the case of (A1), $I(C_\beta \equiv D_\beta)(T) = 1$, as required.

ad R3. Since x_γ is not free in C_β, x_γ occurs in wfp of C_β of the form $\lambda x_\gamma B_\delta$ in which variable y_γ does not occur. Then by rule Iiv, $I(\lambda x_\gamma B_\delta) = I(\lambda y_\gamma S^{x_\gamma}_{y_\gamma} B_\delta|)$. More generally, $I(C_\beta) = I(S^{x_\gamma}_{y_\gamma} C_\beta|)$ for arbitrary model M. Hence $I(A_o) = I(B_o)$, and the result follows as for (R1).

ad additional rules of S. Suppose for an arbitrary S-model M, the premisses of rule: $A_1, \ldots, A_n \rightarrow B$ are true. Then $I(A_1)(T) = 1 = \ldots = I(A_n)(T)$. Hence by the corresponding semantical rule $I(B)(T) = 1$. Whence B is true in M.

As usual, completeness requires some preliminaries. An S-theory a is a class of wff of language L closed under provable identity, i.e. if $A_\mathrm{o} \in a$ and $\vdash_S A_\mathrm{o} \equiv B_\mathrm{o}$ then $B_\mathrm{o} \in a$. Canonically K is the class of all S-theories.

Two wfp A_α and B_α are *equivalent* iff $\vdash_S A_\alpha \equiv B_\alpha$. In virtue of the identity postulates of S the relation is a congruence one which partitions the set of wfp with label α into disjoint equivalence classes $[A_\alpha], [B_\alpha], \ldots$, such that $[A_\alpha] = [B_\alpha]$ iff A_α is equivalent to B_α. That is, $[A_\alpha] = \{C_\alpha \in L : \vdash_S A_\alpha \equiv C_\alpha\}$ is well-defined.

$D_\mathrm{o} = 2 = \{1, 0\}$;

$D_i = \{\langle [A_i], a\rangle : A_i$ is a variable or constant of L and $a \in K\}$; but for a rigid semantics

$D_i = \{[A_i] : A_i$ is a variable or constant of L$\}$ for $1 \leq i \leq m$.

$D_{\alpha\beta}$ is then defined as before, as $D_\alpha^{D_\beta}$. Canonically K is the class of all S-theories. Then D_α is defined as before for each α.

A function Φ, mapping elements of $\{[A_\alpha]\}$ to D_α, for each α, is defined inductively as follows:

Basis 1. $\Phi[A_\mathrm{o}]$ is that function in 2^K that maps $a \in K$ to 1 iff $A_\mathrm{o} \in a$, i.e. $\Phi[A_\mathrm{o}] = \lambda a C_\mathrm{F}(A_\mathrm{o} \in a)$, where C_F is the characteristic function. Evidently $\Phi[A_\mathrm{o}]$ does not depend on the choice of A_o, since if $\vdash_S A_\mathrm{o} \equiv B_\mathrm{o}$ then $A_\mathrm{o} \in a$ iff $B_\mathrm{o} \in a$.

Basis 2. $\Phi[A_j]$ for $1 \leq j \leq m$, is that function in D_j^K which maps $a \in K$ to $\langle [A_j], a\rangle$, which ordered pair serves to represent A_j at world $a \in K$, i.e. it provides the a-section of $[A_j]$. For a rigid semantics however $\Phi[A_j] = [A_j]$.

Induction stage: $\Phi[A_{\alpha\beta}]$ is that (partial) function in $\mathcal{D}_{\alpha\beta}$ whose value for element $\Phi[B_\beta]$ of $\mathcal{D}_\beta$ is $\Phi[A_{\alpha\beta}B_\beta]$. Φ is here well-defined, for if $A'_{\alpha\beta}$ and B'_β are equivalent, respectively, to $A_{\alpha\beta}$ and B_β then $A'_{\alpha\beta}B'_\beta$ is equivalent to $A_{\alpha\beta}B_\beta$, by double substitution.

$\nabla_\alpha = \{\rho \in \mathcal{D}_\alpha : (PA_\alpha \in L)(\Phi[A_\alpha] = \rho)\}$. Thus $\rho_{\alpha k} \in \nabla_\alpha$ iff, for some wfp A_α, $\Phi[A_\alpha] = \rho_{\alpha k}$. Although Φ may only be partially defined on elements of $\{\mathcal{D}_\alpha : \alpha$ is a label$\}$, it is a total function on elements of $\{\nabla_\alpha\}$.

For $\delta = (\ldots((\beta\alpha_1)\alpha_2)\ldots\alpha_n)$, $a_k \in K$, and $\rho_{\alpha_1} \in \nabla_{\alpha_i}$, for each i in $1 \leq i \leq n$,

$$\mathcal{R}_{\kappa[\delta]}\rho_{\alpha_1}\ldots\rho_{\alpha_n}\alpha_\kappa = \xi w(PB_{\alpha_1},\ldots,B_{\alpha_n})$$
$$[w = \Phi\,[A_\delta B_{\alpha_1}\ldots B_{\alpha_n}](a_\kappa)\ \&\ (Ui : 1 \leq i \leq n)(\Phi[B_{\alpha_i}] = \rho_{\alpha_i})],$$

where $\mathcal{R}_{\kappa[\delta]}$ corresponds to initial constant A_δ, i.e. $\mathcal{R}_{\kappa[\delta]} = \mathcal{R}^A_{\kappa[\delta]}$. That is, for constant A_δ and canonical valuation function v, $v(A_\delta) = \mathcal{R}_{\kappa[\delta]}$ where $\mathcal{R}_{\kappa[\delta]}$ is defined as above. Hence also $\mathcal{R}_{(j\kappa)} = \phi[A_j]$.

The *canonical S-model* is the structure $M_C = \langle T, K, D, \nabla, v\rangle$, where K is the class of S-theories, T is that S-theory containing exactly the theorems of S, D, ∇ and also Φ are defined as above, $v(A_\alpha) = \Phi\,[A_\alpha]$ for each initial variable A_α and $v(A_j) = \mathcal{R}_{\kappa[\delta]}$ as defined for initial constant A_δ.

Lemma 3. *For every wfp B_β, $I(B_\beta) = \Phi\,[B_\beta]$.*

Proof is by induction on the construction of B_β, and resembles the corresponding lemma in Henkin 1950, except that the restriction to closed wfp is removed. Since logic S may contain no general method of universal closure the restricted method cannot be applied generally.

(i) If B_β is an initial variable with label β, $I(B_\beta) = v(B_\beta) = \Phi\,[B_\beta]$, by stipulation.

(iii) B_β is of the form $D_{\beta\gamma}C_\gamma$. By the induction hypothesis,

$$I(D_{\beta\gamma}) = \Phi\,[D_{\beta\gamma}] \text{ and } I(C_\gamma) = \Phi\,[C_\gamma]. \text{ Moreover}$$
$$I(D_{\beta\gamma}C_\gamma) = I(D_{\beta\gamma})(I(C_\gamma))$$
$$= \Phi\,[D_{\beta\gamma}](\Phi[C_\gamma])$$
$$= \Phi\,[D_{\beta\gamma}C_\gamma],\ \text{by definition of } \Phi.$$

(iv) B_β is of the form $\lambda x_\gamma C_\alpha$. By induction hypothesis $I(C_\alpha) = \Phi\,[C_\alpha]$.

Let $\Phi[A_\gamma]$ be any element of ∇_γ. Then the value of $\Phi[\lambda x_\gamma C_\alpha]$ for the argument $\Phi[A_\gamma]$ is, by definition of Φ, $\Phi[(\lambda x_\gamma C_\alpha)A_\gamma]$. Then according to (A2), $\vdash (\lambda x_\gamma C_\alpha)A_\gamma = S^{x_\gamma}_{A_\gamma}C_\alpha|$. Hence $[(\lambda x_\gamma C_\alpha)A_\gamma] = [C_\alpha[A_\gamma/x_\gamma]$, whence $\Phi[(\lambda x_\gamma C_\alpha)A_\gamma] = \Phi\,[C_\alpha[A_\gamma/x_\gamma]] = I(C_\alpha[A_\gamma/x_\gamma])$ by the induction hypothesis. Thus the value of $\Phi[\lambda x_\gamma C_\alpha]$ for the arbitrary argument $\Phi[A_\gamma]$, i.e. $I(A_\gamma)$ applying the induction hypothesis again, is $I'(C_\alpha)$ where I' differs from I only

in assigning to $I'(x_\gamma)$ argument $I(A_\gamma)$. Thus $\Phi[B_\beta]$ and $I(B_\beta)$ have the same value for every argument for which they are defined; hence, by extensionality of *MS*, they are identical.

(ii) B_β is A_γ, an initial constant with label $\gamma = (\dots(\beta\alpha_1)\dots\alpha_n)$.

Since for arbitrary $\rho_i \in \nabla_{\alpha_i}$ $(1 \leq i \leq n)$ and $a_\kappa \in K$

$I(A_\gamma)\rho_1 \dots \rho_n a_\kappa = \mathcal{R}_{\kappa[\gamma]}\rho_1 \dots \rho_n a_\kappa$, it suffices to show
$\mathcal{R}_{\kappa[\gamma]}\rho_1 \dots \rho_n a_\kappa = \Phi\,[A_\gamma]\rho_1 \dots \rho_n a_\kappa$,

since equality then follows by extensionality. But in virtue of the definition of ∇, for each ρ_i, $1 \leq i \leq n$, $\rho_i = \Phi\,[D_i]$ for some wfp D_i. Hence it su ffi ces to show

$$\begin{aligned}\mathcal{R}_{\kappa[\gamma]}\Phi[D_1]\dots\Phi[D_n]a_\kappa &= \Phi\,[A_\gamma]\Phi[D_1]\dots[D_n]a_\kappa \\ &= \Phi\,[A_\gamma D_1 \dots D_n]a_\kappa, \text{ by definition of } \Phi\text{-composition.}\end{aligned}$$

However, by definition of $\mathcal{R}_{\kappa[\gamma]}$,

$\mathcal{R}_{\kappa[\gamma]}\Phi[D_1]\dots\Phi[D_n]a_\kappa = \xi w(PB_1, \dots, B_n)$
$[w = \Phi\,[A_\delta B_1 \dots B_n]a_\kappa \;\&\; (Ui : 1 \leq i \leq n)(\Phi[B_i] = \Phi\,[D_i])]$

But $\Phi[B_i] = \Phi\,[D_i]$ iff $\vdash_S B_i \equiv D_i$; and given $\vdash_S B_i = D_i$, $\Phi[A_\delta B_1 \dots B_i \dots B_n] = \Phi[A_\delta B_1 \dots D_i \dots B_n]$ by substitutivity of identicals. Hence by iteration of these steps from $i = 1, \dots, i = n$,

$$\begin{aligned}\mathcal{R}_{\kappa[\gamma]}\Phi[D_1]\dots\Phi[D_n]a_\kappa &= \xi w[w = \Phi\,[A_\delta D_1 \dots D_n]a_\kappa] \\ &= \Phi\,[A_\delta D_1 \dots D_n]a_\kappa, \text{ as required.}\end{aligned}$$

Corollary: $I(A_\mathrm{o})(a) = 1$ *iff* $A_\mathrm{o} \in a$
iff $\Phi[A_\mathrm{o}](a) = 1$

Proof. In view of the lemma, it suffices to show $\Phi[A_\mathrm{o}](a) = 1$ iff $A_\mathrm{o} \in a$. But this follows at once by the definition of $\Phi[A_\mathrm{o}]$.

Lemma 4. *The canonical S-model M_C is an S-model.*

Proof. The main details have already been furnished. As to the remainder:

ad (T1), i.e. to show $\mathcal{T}\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$ iff $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$. Firstly, suppose $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$. Let C_α be a wfp such that $\Phi[C_\alpha] = \rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$. Since $\vdash C_\alpha \equiv C_\alpha$, $C_\alpha \equiv C_\alpha \in T$. Thus $I(C_\alpha \equiv C_\alpha)(T) = 1$, i.e. $(I(Q)I(C_\alpha))I(C_\alpha)(T) = 1$, i.e. $(\Phi[Q]\Phi[C_\alpha])\Phi[C_\alpha](T) = 1$. Hence $\mathcal{T}\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$. Conversely, if $\mathcal{T}\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$,

$$1 = \xi w(PB_\alpha, C_\alpha)(w = \Phi\,[QB_\alpha C_\alpha](T)\ \&\ \Phi\,[B_\alpha] = \rho_{\alpha\kappa}\ \&\ \Phi\,[C_\alpha] = \sigma_{\alpha\kappa}).$$

Thus for some B_α, C_α, for which $\Phi[B_\alpha] = \rho_{\alpha\kappa}$ and $\Phi[C_\alpha] = \sigma_{\alpha\kappa}$,

$$1 = \Phi\,[QB_\alpha C_\alpha](T),\ \text{i.e.}\ (\Phi[Q]\Phi[B_\alpha])\Phi[C_\alpha](T) = 1,$$
$$\text{i.e.}\ (I(Q)I(B_\alpha))I(C_\alpha)(T) = 1,\ \text{i.e.}\ I(B_\alpha \equiv C_\alpha)(T) = 1.$$

Hence $\vdash B_\alpha \equiv C_\alpha$, and so $\Phi[B_\alpha] = \Phi\,[C_\alpha]$. Thus $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$.

ad (∇i) and (∇iii). More generally, $I(A_\alpha) \in \nabla_\alpha$. For $I(A_\alpha) = \Phi\,[A_\alpha]$. But $\Phi[A_\alpha] \in \mathcal{D}_\alpha$, by characterisation; and $\Phi[A_\alpha] = \Phi\,[A_\alpha]$, so $\Phi[A_\alpha] \in \nabla_\alpha$.

ad (∇ii). $\rho \in \nabla_{\alpha\beta}$ iff $\rho \in \mathcal{D}_{\alpha\beta}$ and, for some wfp $A_{\alpha\beta}$, $\rho = \Phi\,[A_{\alpha\beta}]$, i.e. i ff$\rho \in \mathcal{D}_\alpha^{\mathcal{D}_\beta}$ and for a given $A_{\alpha\beta}$ ρ is that function in $\mathcal{D}_\alpha^{\mathcal{D}_\beta}$ whose value for an element $\Phi[B_\beta]$ of $\mathcal{D}_\beta$ is $\Phi[A_{\alpha\beta}B_\beta]$ of $\mathcal{D}_\alpha$, i.e. whose value for element $\Phi[B_\beta]$ of ∇_β is $\Phi[A_{\alpha\beta}B_\beta]$ of ∇_α. Hence $\rho \in \nabla_\alpha^{\nabla_\beta}$, since $\Phi[B_\beta]$ is an arbitrary element of ∇_β.

Theorem 2. *For any logic S on L and any wff A of S, if A is S-valid then A is a theorem of S.*

Proof. Suppose A is not a theorem of S. Then A does not belong to the base T of the canonical S-model M_C. Since $A \notin T$, interpretation I on M maps A to 0, i.e. $I(A)(T) \neq 1$. Hence A is not S-valid.

Corollary (I)**.** *Every logic on a λ-categorial language (system formulable as a logic on such a language) has a two-valued worlds semantics.*

The result is immediate from Theorems 1 and 2.

Corollary (II)**.** *Every λ-categorial language has a two-valued worlds semantics.*

For let T be the truth-logic on L formulated by adding to B as axioms the set of wffof L that are true. Then T has a two-valued worlds semantics, and so therefore does the language.

Corollary (III)**.** (Essentially Cresswell's conjecture, Cresswell 1973, pp. 89–90).

For every fully λ-closed set Γ *of wff(sentences) of* L *(or of* L'*), there is a model* $\langle T, K, \nabla, v\rangle$ *which is characteristic for* Γ*, i.e. for every w ff (sentence)A,* $A \in \Gamma$ *iff* $I(A)(T) = 1$ *where* I *is the interpretation associated with valuation* v*. (A set* Γ *of wff is λ-closed iffevery wffwhich results from elements of* Γ *by rules of λ-conversion or of identity belongs to* Γ*, and fully* Γ*-closed if in addition it contains a wfp of the form* $A_\alpha \equiv B_\alpha$ *for every* α*).*

For take Γ as axioms of a logic on L (or L').

Corollary (IV)**.** *Every many-valued logic on L (system formulable as a logic on L) has a two-valued worlds semantics.* (This result comprehends all present many-valued logics with (finitary) languages.)

For reformulate the logic as a logic on L, and apply (I).

Corollary (V)**.** (Carnap's thesis of extensionality). *For any non-extensional system (in the sense of a fully λ-closed set of wff) formulable on a λ-categorial language there is an extensional system* Γ' *into which* Γ *can be logically translated, i.e. for* $A \in \Gamma$ *there is a w ffA*$' \in \Gamma'$ *such that A and* A' *are logically equivalent* (see, e.g., MN, p. 141).

For define A' as $I(A)(T)$ and Γ' as $\{A' : A' = 1\}$; then applying (III), $A \in \Gamma$ iff $A' = 1$ iff $A' \in \Gamma'$, as required. In short, I serves as a general translation function, to be specified at world T. Since the semantical metalanguage *MS* is extensional, as already argued, the result is established.

Carnap's thesis does not of course imply the *reducibility* of intensional discourse to extensional.

Corollary (VI)**.** *Every (philosophical) theory formulable in a λ-categorial language has a semantical analysis. Thus exact theories of universals, propositions, belief, and so on, will have such analysis.*

Corollary (VII). *Every logic U whatsoever (i.e. no basic logic such as B is assumed) on a pure categorial language L, i.e. a categorial language without conditions on λ, has a two-valued world semantics.*

Soundness is a special case of Theorem 1, but completeness requires new details. A *U-theory* is any class of wffof the language L; and K is canonically the class of all U-theories. For the rest $[A_\alpha]$ is equated with A_α and $\Phi[A_\alpha]$ with $\Phi(A_\alpha)$. Thus

$$\nabla_\alpha \text{ is } \{\rho \in \mathcal{D}_\alpha : (PA_\alpha \in L)\Phi(A_\alpha) = \rho\} \quad \text{and}$$
$$\mathcal{R}^A_{\kappa[\delta]} \text{ is } \lambda\rho_{\alpha_1} \ldots \lambda\rho_{\alpha_n}\ \lambda\alpha\ \xi w(PB_{\alpha_1}, \ldots, PB_{\alpha_n})$$
$$[w = \Phi\ (\!A_\delta B_{\alpha_1} \ldots B_{\alpha_n})(a)\ \&\ (Ui : 1 \leq i \leq n)\Phi(B_{\alpha_i}) = \rho_{\alpha_i});$$

and Lemma 3 establishes that for every wfp B_β, $I(B_\beta) = \Phi\ (\!B_\beta)$. But apart from the replacement of square brackets by round ones, and the omission of special steps for λ the completeness argument goes through as before.

6. *Widening the framework: towards a truly universal semantics*. There are several good grounds for doubt as to the adequacy of result (I) as a basis for thesis

HI. Every logic on every language has a two-valued worlds semantics,

which is presumably what a universal semantics should show.[1] In this section simple enlargements of result (I) are made, with a view to removing the grounds for these doubts; then HI is established under certain, widely accepted, assumptions. Thus a beginning is made on the task of building λ-categorial languages and their semantics into more adequate vehicles for natural language analysis.

A. *Removing the Limiting Effect of Basic Logic B*

Firstly, the auxiliary connective $\equiv$ can be eliminated (in effect relegated to *MS*) and B replaced by a basic logic C of pure λ-conversion. The rules of logic C are just the rules of λ-conversion of Church 1940, p. 60; namely, R3, bound variable change, and

[1] HI, which has as a corollary that *every natural language has a many-valued worlds semantics*, follows from (I) given a translation thesis of the form

H. Any logic on any language may be reformulated, preserving requisite semantical properties, as a logic on a (free) λ-categorial language.

Thesis H raises, however, vexatious questions as to the structure of language in general – questions Wittgenstein 1953 tried to talk us out of asking, but which can now be answered quite generally in the case of what are called "formal languages".

RC. Where D_o results from C_o by replacement of any wfp $((\lambda x_\gamma A_\beta)B_\gamma)$ by $A_\beta[B_\gamma/x_\gamma]$ or conversely, then if C_o is a theorem so is D_o.
(λ-*conversion rules*)

Result (I) extends to logics which include C as basis in place of B. The semantics is as before except that $\mathcal{T}$ need not occur and T1 is of course not required. Soundness is provided along the same lines as before: the case of RC illustrates the main detail.

ad (RC). For arbitrary model M, $I(A_\beta[B_\gamma/x_\gamma]) = I((\lambda x_\gamma A_\beta)B_\gamma)$, as shown in verifying (A2) in the case of logic B. But then $I(C_o) = I(D_o)$, whence, as $I(C_o)(T) = 1$, $I(D_o)(T) = 1$.

For completeness, a relation conv which does the work of provable identities is defined, thus:

> conv is the least Leibnitz identity relation on subscripted wfp of S, i.e. equivalence relation which guarantees full substitutivity (as for R3), such that $((\lambda x_\gamma A_\beta)B_\gamma$ conv $A_\beta[B_\gamma/x_\gamma]$ and $S^{x_\gamma}_{y_\gamma}C_\beta|$ conv C_β, where x_γ is not free in C_β and y_γ does not occur in C_β.

Upon replacing $\vdash_S A_\alpha \equiv B_\alpha$ uniformly by A_α conv B_α, the completeness argument is as before. Thus an S-theory a is a class of wffclosed under conv, i.e. if $A_o \in a$ and A_o conv B_o then $B_o \in a$; and A_α and B_α are equivalent iff A_α conv B_α. A corollary of the extended (I) is Cresswell's conjecture:

Corollary (VIII)**.** *Every λ-closed set Γ of wffof L (or of L') has a characteristic model $\langle T, K, \nabla, v\rangle$* (and hence has a characteristic Cresswell model $\langle \underline{\underline{D}}, \underline{\underline{T}}, V\rangle$ in which $V = v$, $\underline{\underline{T}} = T$, and in which the domains of $\underline{\underline{D}}$ need not be stratified; cf. Cresswell 1973, pp. 74–99).

It is certain, however, that λ-conversion does not apply within quotational linguistic contexts, and decidedly dubious that it operates within more highly intensional linguistic contexts.

Fortunately, secondly, the general requirement that λ-conversion holds everywhere can be relaxed. Divide the structure labels of language L into two classes, the SA (or substitution admitting) labels and the $\widehat{\text{SA}}$ labels, subject to the requirements:

(i) $0 \in$ SA;

(ii) $\alpha,\beta \in \text{SA}$ iff $(\alpha\beta) \in \text{SA}$.

The impact on the postulates of logics B and C is as follows: A1 attracts the rider "for $\alpha \in$ SA" and A2, R2 and RC the rider "for $\beta,\gamma \in$ SA". The upshot is that there are linguistic frames in which λ-conversion and structural identity substitution are not permitted, notably those which have associated with them labels not in SA. The method enables the treatment of quotation within logics on λ-categorial languages, in this way for example. Suppose label 7 does not belong to SA, and let (type-) sentence quotation be represented by a pair of functors, $\text{Qu}_{(70)}$ and $\text{Ct}_{(17)}$, with "A_o" $=_{\text{Df}}$ $\text{Ct}_{(17)}(\text{Qu}_{(70)}A_o)$. (Alternatively, one functor could operate on the expression plus right quote and then the other on the left quote and the resultant, somewhat like Dirac's bras and kets.) It follows that the logic does not legitimise substitutions and conversions within quoted wff.

Result (I) and its corollaries hold for logics on these extended λ-categorial languages, once the semantical analysis is adjusted. The main change concerns interpretation rule Iiv, which is amended thus:

Iiv′. Where A_δ has the form $(\lambda w_\beta B_\gamma)$ and $(\gamma\beta) \in \text{SA}$, $I(\lambda w_\beta B_\gamma)$ is defined as before, i.e. as in rule Iiv, but where $(\gamma\beta) \notin \text{SA}$, $I(\lambda w_\beta B_\gamma)$ is some (arbitrary) element of $\nabla_{(\gamma\beta)}$.

Where the basic logic is B, T1 holds subject to the proviso: $\alpha \in$ SA. These adjustments take care of the soundness part of (I), but completeness requires a further adjustment: though $\Phi[A_\alpha]$ is defined as before where $\alpha \in$ SA, for $\alpha \notin$ SA, $\Phi[A_\alpha] = A_\alpha$, as in the case of U logics on pure categorial languages.

Henceforth it is assumed that logics on λ-categorial languages include those on extended λ-categorial languages, perhaps without a structural identity. Observe that the restriction to *lambda*-categorial languages has been substantially lifted; and by labelling the remaining restriction R3 can be removed.[1]

[1] The logical theory may be enlarged in other ways as well. In particular, the conditions on structure labels of free λ-categorial languages may be further relaxed, by introducing, following Rennie, an ordering relation on structure labels. In this way the universal theory can *directly* encompass both transfinite type theories, such as that of Andrews 1965, and the very substantial enlargements on what can be said in type-theoretical languages incorporated in Rennie's unpublished work. Also the theory may be made polyvalent, to take due account of such values as non-significance and, perhaps, incompleteness. And its generality can be demonstrated; e.g. it can be shown to include all quantificational devices.

B. *Removing the Restriction to Categorial Languages: Method 1*

It may be that only a (recursively enumerable) subclass of wffof a categorial language is grammatical, or, equivalently, that the class of grammatical sentences of a language is embeddable in a categorially-determined class of wff.

A logic U is *initially formulable* as a logic on a λ-categorial language L iff U is representable by a structure $\langle \mathcal{P}, \mathcal{F}, \mathcal{K}, \mathcal{R} \rangle$ where $\mathcal{P}$ is the set of symbols of L, $\mathcal{F}$ the set of U-wfp (or of significant phrases) is a (recursively enumerable) subset of the set of wfp on $\mathcal{P}$, and $\langle \mathcal{K}, \mathcal{R} \rangle$ is a logic on L (as previously defined), and further $\mathcal{K} \subseteq \mathcal{F}$ and if the premises of a rule of $\mathcal{R}$ are in $\mathcal{F}$ so is the conclusion. Thus $\mathcal{F}$ is a supertheory of the theory $\mathcal{T}$ of theorems of U, and can be modelled in the same way as $\mathcal{T}$. A logic is *formulable* as a logic on a λ-categorial language L iffit is (recursively) re-expressible as a logic which is initially formulable on L. Theorems 1 and 2 and their enlargements and corollaries extend (in a way that has already been allowed for in the statement of corollaries) to logics formulable on λ-categorial languages.

While these shuffles can help in solving the excessive width problem of systems on λ-categorial languages, that too many expressions get through as well-formed, they do nothing to meet the excessive narrowness problem, already discussed, that λ-categorial languages appear to rule out as ill-formed, or at least as radically ambiguous, perfectly admissible expressions of natural languages. The method thus far does not resolve, then, the question of a universal semantics for every logic on every language. To bring method 1 to fruition it will have to be combined with some liberalisation of extended λ-categorial languages.

C. *Solving the Fundamental Problem by Free λ-Categorial Languages?*

λ-categorial languages are next extended, with a view to escaping the fundamental adicity problem, by allowing the assignment to constants not just of a single structural label, but perhaps of a multiplicity of labels. Just this appears to happen, at first glance anyway, in natural language grammars. For example, the adverb "slowly" modifies verbs of different adicities and has, prima facie, the labels (01)(01),((01)1)((01)1), (((01)1)1)(((01)1)1), etc. Should one try, amateurishly, to write down phrase structure rules for English a similar phenomenon quickly emerges; e.g. an adjective is assigned different structural labels, (22) or 1 (or possibly (01)((01)1) or possibly a new label 5) accordingly as it

occurs attributively or predicatively. Allowing for more than one label for given constants circumvents these problems, and also enables us to say what we do say, that the one constant, "water" for instance, can function in a multiplicity of ways – as

(i) a sentence, whether as a question, order, assertion, depending on the context;

(ii) a subject as in "water is here";

(iii) a common noun as in "The water is hot";

(iv) a verb as in "I water the garden" or "My eyes water".

In short such freedom appears as a fundamental feature of natural languages, in contrast to prevailing formal ones, and hence the "fundamental problem".

It may be that in giving way to this natural language licence nonambiguity conditions (e.g. condition (v) of subsection 1) are violated. If so this is a small price to pay: what is crucial is that the desirable flexibility of natural languages is gained without sacrificing the important functionality features of λ-categorial languages.

Allowing for multiple labelling of constants severs the link with type theory. For though the same constant can carry several labels, one and the same *thing* cannot be (even variously) a truth value or proposition, an individual, a class, etc., in the crazy way that would be required to maintain the parallel between linguistic theory and thing interpretations. Free λ-categorial systems force the linguistic interpretation.

To allow for multiple labelling of each constant, the formation rules of L are amended as follows:

(2) Countably-many constants:

$$C, D, Q, a, b, C(1), D(1), \ldots$$

each of which has (finitely-) many (and at least one) structural labels associated with it.

Then a constant alone with *one* of its associated structure labels is a wfp, e.g., where A is a constant and α is one of its labels then A_α is a wfp. Otherwise the rules are as before. Thus A_o is a wffif it is well-formed for *some* labelling of its constants.

The semantics is correspondingly adjusted. A constant A is assigned *one relation* $\mathcal{R}^{A}_{\kappa[\alpha]}$ by (*v*2) *for each associated label* α, i.e. A has associated with it by v a set of relations, corresponding to its set of labels.

Otherwise everything works as before. In particular, since inductive clauses have not been interfered with but only base clauses, soundness and completeness follow as before. Accordingly corollaries (I)–(VII) generalise to systems formulable on free (extended) λ-categorial languages.

Method (1) can accommodate any (finitary) formal language when (2) is combined with (3). For all finite strings of symbols drawn from a finite vocabulary can be represented in free λ-categorial languages, and any subset of the set of strings can be picked out by way of a predicate G. Also any phrase structure rewrite rule: $\phi \rightarrow \psi$, can be represented in the logic: $G\phi \rightarrow G\psi$. Then $\mathcal{F} = \{A : GA\}$. Hence HI is established for every (finitary) formal language, i.e. for every language in the standard sense (as set out, e.g. in Kimball 1973.)

D. *Method 2: the Addition of Transformations*

Despite the promise of method 1, which in its unembellished form would do away with reductions to canonical form and which may indeed be adequate for natural language analysis, linguists now prefer the method of reduction to canonical form by way of transformations. It is evident that unless method 1 is applied, and grammatical sentences distinguished from wff, categorial languages will be far from universal. For every categorial (λ-categorial) language is a context-free language (as is easily shown by converting the formation rules into rewrite rules); and context-free languages form only a proper subclass of formal languages. (Moreover even if natural language grammar is context-free, sentence significance is not a context-free matter but is context-sensitive: see Slog, Chapter 4.) Similarly free λ-categorial languages, which in effect simply duplicate the constants of λ-categorial languages, are context-free languages, and thus hardly universal. Yet for universal semantics the logics considered must be built on universal languages.

The addition of transformations, however, enables the whole class of formal languages to be comprehended.

Lemma 5. *Every recursively enumerable language (unrestricted rewriting system) is generated by some free categorially-based transformational grammar (which meets the con-*

ditions on recoverability of deletions and which uses filter and postcyclic transformations – call these admitted *transformations).* (The terminology is that of Kimball 1967; for valuable background see Peters and Ritchie 1973.)

Proof follows from the propositions:

(a) Every recursively enumerable language is (weakly) generated by some regular-based transformational grammar (with the requisite features);

and

(b) The (weak) generative capacity of free categorial grammars includes that of regular grammars.

Proposition (a) is the main result of Kimball 1967. To prove (b) it su ffi ces to show that each right-branching regular grammar G can be represented as a free categorial grammar. The rewrite rules of G are exclusively of the form $\alpha \to C\beta$ and $\alpha \to A$. The rules of a categorial grammar take the form $\alpha \to (\alpha\beta)\beta$ and $\alpha \to A$, where A has label α; for structure labels can be construed as nonterminal symbols. In a free grammar the restriction that A has label α can be removed. Thus it is enough to show that rules of the form $\alpha \to C\beta$ can be represented. But such a rule is supplied by the rules $\alpha \to (\alpha\beta)\beta$ and $(\alpha\beta) \to C$ in combination.

Actually Kimball's work (Kimball 1967, p. 195) also establishes the universality of Montague's universal grammar, and sharply delimits the class of relations required in linking disambiguated languages with (finitary) languages in general (to the class of Chomsky transformations which also allow any transformation to write in the output tape one of a finite list of markers). Thus the class of finitary Montague languages of Montague 1970a coincides with the class of unrestricted rewriting systems. But really much more control over the admissible class of transforming relations is required. For, as it is, the base grammar can cease to make a distinctive contribution, all the generality being gained through the transformations: yet the superiority of categorially-based grammars is supposed to lie precisely in the ability of the base to reveal and control language structure.

Just one assumption is now required to complete the proof of HI, but it is a large one, namely a version of the Katz–Fodor hypothesis that transformations preserve meaning.

Let L_1 be any recursively enumerable language and S_1 any logic on L_1 (for simplicity S_1 can be construed as a subset of L_1). By Lemma 5, there is a free λ-categorial language, L_2 say, from which L_1 is generated by transformations, T say, and there will also be a subset, S_2 say, of L_2 which generates S_1 by (some subset of) T. Then the hypothesis is, in precise form,

TH. The semantics of S_1 on L_1 is the same as the semantics of S_2 on L_2.

Thus, since S_2 on L_2 has a two-valued worlds semantics, so does S_1 on L_1.

Theorem 3. *[Given the Katz–Fodor hypothesis (in form TH)] every logic on every recursively enumerable language has a two-valued worlds semantics.*

Hence HI is established for all formal languages, on the assumption TH. And so long as the transformations in T simply rearrange wfp, delete repetition and suchlike, TH is not implausible. But it is possible to delete the assumption TH altogether, and to prove HI directly, as method one reveals.

7. *Allowing for context-dependence in the semantical evaluation*. It is a truism – though one inadequately noted in theories of language – that context-dependence is a pervasive feature of natural language analysis. The context-dependence of language components may be taken account of either syntactically or semantically (as Slog, section 7.2 explained); and where it is done semantically, as is here supposed, there are isomorphic ways of doing it. Most simply the set of worlds K can simply be reconstrued as the cross-product of worlds and contexts $W \times C$, and thus semantical evaluations with respect to worlds replaced by evaluations with respect to a world-context pair (as in Slog). Alternatively, since $D_i^{W\times C}$ corresponds to $(D_i^W)^C$ and also (under a different mapping) to $(D_i^C)^W$, the semantical analysis provided above can be regarded as giving a functional analysis to be completed by application to a context (somewhat along the lines of Cresswell 1973 in the latter case); e.g. to complete $I(A)(a)$ it is applied to an element c of C yielding $I(A)(a)(c)$ as a completely assessed expression.

For a semantics for S on L which allows for context-dependent evaluations (which will show up in the specific rules given for personal pronouns, egocentric particular terms, and so on), S-models are complicated by replacing K by the pair (W, C). Thus a basic S context-model is a structure $M = \langle T, W, C, D, \nabla, v\rangle$ where W is a set of worlds and C is a set of contexts (a context being given, as in Slog, by a certain set of statements). Then

on the simplest method K is defined as $W \times C$ and the remainder of the definition of M, and indeed everything else, is as before; soundness and completeness results extend automatically.

For the isomorphic semantics there is a little more work. For example, in the $(D^W)^C$-form, the $\mathcal{D}$ functions are defined thus: $\mathcal{D}_j = (D_j^W)^C$ for $1 \leq j \leq m$; $\mathcal{D}_{\alpha\beta}$ is as before. Completeness can be obtained by exploiting the isomorphism, e.g. for c in arbitrary index set C,

$\Phi[A](a)(c) = 1$ iff $A \in (a, c)$.

8. *Applying the semantical theory to yield semantical notions: the two-tier theory*. A universal semantics of the sort given provides a basis and framework for the main components of what is commonly called a theory of meaning. However it does not provide the theory, but only the framework. To obtain satisfactory theories of synonymy and sense and of entailment and propositional identity, for example, further construction work has to be done. A general theory of meaning and of intensional notions, is, to continue the metaphor, a necessary superstructure which fits onto and completes the theory of truth. But the superstructure can have many different designs even when the truth substructure is already determined.

There are many previous engineers who have observed the main structural principles and designed their edifices accordingly – Wittgenstein, Tarski, Carnap, Kemeny and Montague to mention some of the most important innovators among them. All these semantical engineers have been seriously hampered both by inadequacies in the truth substructures on which they based their superstructure designs – either by the inadequacies of the languages they considered to the discourse that has to be accounted for, or, more important in the case more adequate languages, by the limitations of their semantical apparatus, in particular again the limitation to possible worlds and to consistent theories – and by severe limitations in superstructure technology, especially that supposed to take care of higher level intensional notions such as synonymy and meaning which typically got treated as if they were modal notions – indeed in leading designs the significantly different levels of intensionality have all been collapsed to the initial modal level. These inadequacies in previous designs can now be overcome; this provides one of the excuses for the newer and more elaborate plans sketched here: of course the newer plans – which

still remain far from perfect – have tried to take advantage of the virtuous features of earlier designs, and especially the work of Kemeny 1956.

The new design is of a two-tier construction with the second, model, tier largely a copy of the first, world tier. In a discriminating general semantical theory (of the sort RLR, chapter 14 is intended to represent) the worlds or situations are classified, semantically important worlds or classes of worlds being separated out. For example, the base or factual world T of a model M, the world at which truth in M is assessed, is distinguished among the regular worlds, those of class O, of M. The regular worlds are in turn a subclass of the normal worlds, i.e. $O \in K$. Thus far the structure of M, with components T, O, and K, is simply that adopted in semantical analyses of relevant implication and entailment; but for the analysis of higher levels of intensionality than modal and entailmental levels further classes of worlds enter the picture, in particular the class W of all worlds and also certain regular featuring subclasses of W. Thus a general model of M takes the structural form $\langle T, O, K, W, \ldots, I\rangle$ – the exact or final form of the first tier M will not matter for the theory to be outlined – with I a valuation or interpretation defined on initial formulae of the language and on worlds and contexts. Function I may also supply relations on worlds for each constant of the language, or such relations may be independently supplied by the model structure. (The model of p. 413 is thus complicated and relettered.)

In the universal semantics given, upon an elaboration of which the two-tier theory builds, there are essentially two stages in determining a model:

(i) The general framework of assignments for each initial formula is set up;

(ii) Modelling conditions are imposed to ensure that every theorem is true in the model.

This is achieved in the elaborated semantics presupposed by requiring that the modelling conditions corresponding to each axiom and to each rule hold for each world a in O. For the two-tier theory stages (i) and (ii) are separated, and *frameworks* or *basic models* which satisfy (i) but perhaps not (ii) are also considered. In other words, a framework is like a model except that it may not conform to the modelling conditions imposed. (In the general extensional case studied by Kemeny 1956, frameworks are called *semi-models*.)

The universal semantics defines, for every framework and every world or world-context pair b of that framework, an interpretation $I(A, b)$ for every wffin sentence A of

the language under investigation; $I(A, b)$ has one of the values 1 (holds) or 0 (does not hold) – or, on the significance enlargement of the semantical theory, which will be allowed for, n (does not significantly hold). Relative to a framework M, truth is holding at the base world T of the framework, i.e. A is *true in* M iff $I(A, T) = 1$; and non-significance is failing to hold significantly at T, i.e. A is *significant in* M, i ff$I(A, T) \neq n$. Neither truth nor significance are so far defined in an absolute, i.e. a framework-independent, way. The absolute notions defined in the universal semantics, like those of logic textbooks expounding the routine semantics of quantification theory, are *validity*, i.e. truth in every model, and *satisfiability*, i.e. truth in some model: not truth or designation or any of the intensional notions a really general theory should explicate.

That is to say, by way of summary, the universal semantics does not, on its own, provide satisfactory metatheoretic analyses of *any* of the main terms usually listed as belonging to the theories of meaning and reference without further – and, as it turns out, problematic – ado. What are characterised in a model-independent way in such semantics are such notions as validity and satisfiability, not even such central semantical notions as meaning or truth. Admittedly the semantics does define, or allow one to define, truth and meaning in a model-relative fashion; for example, in the course of defining validity of a statement in the universal semantics truth in a model is defined, as holding in the base world of the model.

But what is required to define truth itself is a distinguished (basic) model. For once a *real*, or factual, model $\underline{\underline{M}}$ is distinguished among the class of models truth is readily definable in terms of holding in the base world of the real model, i.e. A is *true* if $I(A, \underline{\underline{T}}) = 1$, where $\underline{\underline{T}}$ is the base world of $\underline{\underline{M}}$ and I is the interpretation function of M. Similarly, given a real model, meaning can be defined as a function on it, more specifically as a function from worlds and contexts of the real model to values in the appropriate domains of the model. Observe, moreover, that the role of $\underline{\underline{M}}$ (or sT, in a more revealing way of writing it) in the class of models sW is like that of base world T in class W.

It soon appears that other model-theoretic analogues of worlds are going to be needed, a class sO of regular models, or interpretations, in order to define necessity, possibility and other modal notions in an absolute way, a class sK of normal models to define entailment absolutely, and so on. Such a classification of models already appears

in a rudimentary form in Kemeny, where interpretations, sO, are a proper subclass of semi-models, sW, and a real interpretation, as is distinguished in sO. Such a truncated classification is however quite inadequate for proper characterisation of more highly intensional notions; for these a fuller second tier, with more discriminatory power, is wanted.

The idea of the two-tier theory is this: firstly, that a second tier can be constructed, that models can be classified along the plan of the classification of worlds and secondly, that given this classification, absolute notions can be defined in much the way that model-relative notions have been defined. Corresponding to models there are, then, *realisations* (to assign an old term an appropriate new role): a realisation sM is a structure of the form $\langle sT, sO, sK, sW, \ldots \rangle$: it is the second tier. Given that sW has already been characterised by the universal semantics, there are two main problems in obtaining satisfactory absolute characterisations of such notions as truth, entailment and meaning: (1) devising appropriate definitions in terms of elements of sM – a task already accomplished for several important lower level notions – and (2) characterising the appropriate elements of sM on which the definition depends, e.g., sT in the case of truth, sO for analyticity, and sK for entailment. Attempting to solve these problems for specific semantical notions will be the primary objective of subsequent sections.

In view of the philosophical and semantical importance of many of the notions for which the characterisation problems arise, it is surprising that it is sometimes said, e.g. by Cresswell 1976, p. 204, that *all* that is required of semantics is to furnish a theory of interpretation, i.e. of valuation functions at each index in every model. Required for what? one is inclined to ask. It is certainly not good enough for philosophical purposes, for the model-independent accounts of truth, propositional identity, sense, and so on, which are expected to flow from an adequate semantical theory. It should transpire, however, that a suitable theory of interpretation *when supplemented* – notably by a model-independent definition of truth and by the elements of (1) above – does supply everything. Elsewhere (Cresswell 1973 in particular) Cresswell himself is concerned to offer semantical analyses of synonymy and propositional identity, so his claim is perhaps best read contextually, as a criticism of the way in which others (e.g. Montague 1974) have gone about setting up their theories of sense and synonymy – as if some sort of Fregean sense-reference theory really had, despite its manifold defects, to be incorporated into the semantical scheme of things.

Much more emerges, however, from the claim that all that is required of a semantics is a theory of interpretation. Firstly, insofar as the semantical theory aims to be appropriately general, and to encompass semantically closed natural languages, a serious dilemma arises. The reason is that among the specific terms to be analyzed, and for which a theory is required, are such terms as *sense* and *synonymy*, i.e. what is said not to be required is required. But, secondly, these analyses are of terms within the language, whereas the usual analyses are of metalinguistic terms. This raises the question – closed offby Tarski (1944 and 1956) and Carnap MN but recently reopened with the readmission of semantically closed languages – as to what the semantical enterprise should be about, whether it should be of terms within the language or should be of metalinguistic terms. The study of entailment has made the answer clearer: there should be analyses of both sorts, and where the object language contains a satisfactory entailment connective there should be agreement between the object language notion and the metalinguistic analysis, e.g. $\vdash A \Rightarrow B$ iffthat A entails that B. This illustrates the fundamental *principle of tier agreement*, which will be applied repeatedly in obtaining metalinguistic analyses from systemic ones.

Should the structures of the levels of language theory be observed in the metalinguistic case, the analysis of the object language notion will be more comprehensive than that of the metalinguistic analysis; for the semantical analysis of the systemic notion has to account for iterated occurrences, of the entailment connective, whereas the analysis of the metalinguistic relation is essentially only a first-degree matter, that is iterated occurrences need not be accounted for. In what follows the analyses proposed and examined will be metalinguistic ones; but these should be regarded only as a prelude to more complex analyses of systemic notions. The larger and quite essential undertaking is supposed, of course, to encounter insuperable obstacles, deriving from the semantical paradoxes and their like: such analyses are said to immerse us in inconsistency and in all the problems of semantically closed languages (for a recent statement of this Tarskian position, see Chihara 1976). However the fact is that many semantically closed languages – natural languages in particular – are perfectly in order logically as they are (cf. UL [reprinted in Vol. 4 *—Eds.*], which meets the criticisms of Chihara 1976).

With a genuinely universal semantics we do have all that is said to be required of semantics in the *narrow* sense – for though we are far from having satisfactory semantical analyses for a great many natural language constructions, we do possess a universal theory

which furnishes adequate modellings for a very wide class of languages. In this respect the situation is not dissimilar from that in many other areas: for example, we have a general meteorological theory (which consists essentially of an assemblage of aerodynamical and thermodynamic laws) but we are unable, for several reasons, to apply it in very many concrete cases, especially those of weather prediction; and likewise we have a universal theory of optimisation which however can only be applied in some very special cases, often because we lack the extra information required to apply it elsewhere. With the universal semantics it is much the same: we lack the further details for fitting specific constructions and terms within the general framework; and this implies too that often we do not really know how general the general framework needs to be for specific languages. That is to say, a narrower class of modellings of languages than the universal one may suffice for specific languages and classes of them; the universal theory may be a lot more general than need be, or is, desirable for handling them. A simple example is provided by the class of normal Lewis modal logics: although the universal semantical theory grinds out semantics for these logics, some of the apparatus used is unnecessary, and simpler and more informative relational (Kripke) semantics can be provided in every case of interest.

But in a proper wider sense, a "universal" semantics has to solve the characterisation problems for the main semantical notions.

9. *The problem of distinguishing real models*. A serious but curiously neglected problem is how to determine or select – or to avoid selecting – a model in terms of which truth and meaning can be defined in a model-independent way. There are various strategies, some of them rather devious, that have been tried. For example, Leibnitz can be taken as proposing that one choose the best possible model, an optimisation recipe that gets transformed in modern work to the more subjective proposal that one choose the preferred; Kemeny 1956, p. 2 invites the author of a system to select a model or (later, p. 8, in more strong-arm fashion) insists that he supply such a model; Tarski (in Tarski 1956 and elsewhere) and Carnap (e.g. in MN) require that a translation of the object language into the metalanguage, be supplied; Cresswell (1973, p. 38ff), adapting Wittgenstein 1947, supposes that we are given some model built from a set B of "basic particular situations".

It emerges from the case of truth definitions that none of these strategies is without substantial difficulties. A first problem is circularity. For what is required, in order that the definition of "statement A is true in selected framework M" should provide us

with a definition of truth, of "A (of L) is true", is that the framework M selected is a *correct* one, one whose base world T is the factual world, and represents the class of true statements. Thus in order to define truth we have already, in effect, to be supplied with the class of truths, T. An irremediable circularity thus appears to have crept into the business of giving a semantical definition of truth. To avoid this problem resort is made to independent criteria for selecting M. But none of the recipes proposed is unproblematic. Consider the optimisation recipes. Sadly it is all too evident that the model in which we live, so to speak, is far from optimal and certainly far from what many would prefer, or choose, if given the option: and hence it is evident that when selection of the model is made in such ways incorrect assignments can result, truths coming out as false (e.g. because not preferred), and falsehoods coming out as true (e.g. because preferred). Nor is it enough that apparatus which determines the model be given; for all the notions of the theory of reference, the model has to be *given correctly*. If it is simply given it may be given for reasons apparently quite other than truth, e.g. because of simplicity or for mere usefulness[1] – in which case the method would provide a way of reinstating a pragmatic "theory of truth".

In this way it becomes evident that each theory of truth can furnish its own criteria for determining $\underline{\underline{M}}$. Thus according to the correspondence theory $\underline{\underline{M}}$ is simply the factual model with the interpretation function I giving the correspondence relation; according to the coherence theory M is that model which coheres with experience; and so on. Traditional issues as to truth appear again in the issue of the determination of $\underline{\underline{M}}$ (or $\underline{\underline{T}}$ and I).

Despite this reappearance of philosophical issues at the base of the semantical account, it has seemed to many that the Tarski–Carnap requirement of a translation of the object language (for which truth is defined) into the metalanguage, enables an escape from these difficulties, and so from a charge of circularity. But the translation requirement does not escape the issues but only serves to obscure what is going on. For suppose the translation is incorrect (e.g. because based on a defective account of truth, or of what is true) or even dishonest. This is tantamount to determining $\underline{\underline{M}}$ incorrectly (or dishonestly), since in the same way incorrect assignments will result. The Tarski–Carnap method may well go wrong, that is to say, except with uninterpreted object

[1] For similar reasons Quine's central thesis, that a pragmatically selected canonical language limns the most general traits of reality, is fundamentally mistaken.

languages where there is no cross-check on correctness, but where, correspondingly, the question of truth really does not enter. Suppose however we are dealing with an already interpreted or understood language, say with a (semantically open) fragment of English which includes statements such as "Pharlap is a horse", and let us choose our translation I (rules of designation in Carnap's sense) as follows: $I(\text{Pharlap}) = $ Porky the pig, and $I(\text{is a horse}) = \lambda\, x\, \text{horse}(x)$. Then by the rule of truth for atomic sentences (cf. MN, p. 5)

$$I(\text{Pharlap is a horse}) = 1 \text{ iff } (\lambda\, x\, \text{horse}(x))\ (\text{Porky the pig});$$
$$\text{i.e. iffhorse (Porky the pig) ;}$$

that is "Pharlap is a horse" is true (in the fragment of English) iffPorky the pig is a horse. It is evident that the translation is incorrect since it leads to falsehood, as "Pharlap is a horse" is true whereas "Porky the pig is a horse" is not true; and it is also evident that the source of incorrectness is the use of an already understood object language which has a different intended interpretation I, i.e. for which $I(\text{Pharlap}) = $ Pharlap (the horse). For an uninterpreted object language for which the translation given just did supply the intended interpretation there would be no such possibility of incorrectness. Yet, perhaps surprisingly, the use of incorrect translations leads to no violation of Tarski's convention T (Tarski 1956, p. 187–88); for " 'Pharlap is a horse' " is a name of the English sentence "Pharlap is a horse" and "Porky the pig is a horse" is the translation of " 'Pharlap is a horse' " into the metalanguage (and "is true" is tantamount to "Tr" by the class abstraction principle). It follows that, contrary to widespread claims and to Tarski's large assumption incorporated in the very formulation of convention T, satisfaction of convention T is not sufficient for an adequate definition of truth. This inadequacy will become more conspicuous once we have seen that the translation requirement is equivalent to choice of a basic model; for then it turns out that any choice of a model, not just the choice of a real model $\underline{\underline{M}}$, will bring out convention T. Convention T, like the unqualified translation requirement, is no help in determining $\underline{\underline{M}}$, unless the translation involved is correct – as an identity translation, with $I(A) = A$, which includes the object language in the metalanguage, will generally be.

In the case of extensional languages, the specification of a translation in the intended sense (that of rules of designation) is equivalent, as Kemeny points out (Kemeny 1956, p. 14ff.), to the specification of a basic model. It is simplest to illustrate the

equivalence argument in the case of an applied quantificational logic Q, but the argument extends straightforwardly to Church's simple type-theoretic language (as Kemeny explains). Suppose, firstly, a model for Q is given: it will consist of a domain D of individuals and an interpretation function I defined on initial expressions of Q, say subject terms and predicates, and taking subject terms to particulars of D and predicates to relations on elements of D. Define a new function I' as follows: where t is a subject term $I'(t) = I(t)$, and where f is a predicate $I'(f) =$ instantiates $I(f)$. Then I' provides a translation, almost exactly as in Carnap (MN, p. 4): indeed it is valuable to take Carnap's main example in MN as a working illustration. Suppose, conversely, that a translation tr is provided, i.e. a function taking initial expressions of Q into appropriate metalanguage expressions, say subject terms into subject terms and predicates into relations. Define an interpretation I thus: $I(t) = \mathrm{tr}(t)$ for subject term t, and $I(f) = \lambda\, x\, (\mathrm{tr}(f))(x)$. Then $\langle D, I\rangle$ where $D = \{t : \mathrm{tr}(t)\}$ provides an interpretation of Q matching tr.

Since translations are tantamount to basic models, the problem of selection of a real model automatically transfers to a problem of selection of a translation – to the determination of a correct translation. In the case we are concerned with, that of intensional languages, the interrelation is more complex, basic models corresponding to translations at each world of the model (or alternatively to translations not just of initial expressions, but of complex expressions as well – but then recursiveness is sacrificed).

That the received, translation, method – which really assumes a selection – does not properly consider correctness can be seen from another angle, from the fact that on the received account a thesis of a system L, any system, cannot be false. But of course the theses of a theory or language, or even a logic, can be false. Some principles of classical logic are false (see RLR). Thus a satisfactory recipe for the determination of $\underline{\underline{M}}$ will have to allow for the possibility that $\underline{\underline{M}}$ is only a framework, not a model. In case framework $\underline{\underline{M}}$ for system L is a model, L will be said to be *in order* (in effect, it has a *normal* truth definition in Wang's sense in Wang 1952).

In order to see how the actual Tarski–Carnap–Kemeny procedure – as distinct from the general theory they elaborate – *can* provide a reliable guide for determining framework $\underline{\underline{M}}$, even in the case of intensional languages, consider how truth *is* assessed where an interpreted language or system is involved. Suppose, for example, that the object language is Portuguese and the metalanguage, or universal language, is English.

There are two requirements to be met, not just one; namely (i) correctness of translation, and (ii) material adequacy in the sense of convention T. There is a more important special case where requirement (i) is automatically met, that where the object language – no matter how comprehensive – is included in the metalanguage or, better, in the universal language (Curry's replacement, in Curry 1963, for the metalanguage). While this inclusion offers a reliable insurance against incorrect translation (by using an identity translation), it does not ensure that convention T will be satisfied; for many frameworks T will fail. This suggests, what is legitimate, defining the real, or factual framework $\underline{\underline{M}}$ as an arbitrarily selected basic model for which convention T holds for every sentence. That is, $\underline{\underline{M}} =_{\mathrm{Df}} \xi M(A)(I(A,T) = 1 \text{ iff } A)$. In the case of extensional languages, where the interpretation of every wffcan be recursively determined in terms of that of its components and variants just in the base world T, it would su ffi ce to require convention T for every *initial* wff; but for intensional languages a more comprehensive connection is necessary, as such a single-world recursive procedure is impossible. Almost needless to say, there will be an element of circularity – but not a damaging element – in subsequent semantical definitions which make use of $\underline{\underline{M}}$. For example, truth is going to be determined in terms of truth in $\underline{\underline{M}}$, where $\underline{\underline{M}}$ is picked out as a framework which gets the facts right as stated in the metalanguage. To this rather limited extent the definition writes in a correspondence theory of truth.

The general case where the object language differs from the metalanguage is not so neatly disposed of. But it is clear what in principle would suffice. Were we given a *correct* translation of the object language into the metalanguage, with $\mathrm{tr}(A)$ translating A, then $\underline{\underline{M}}$ could be determined as an arbitrarily selected framework M such that, for every sentence A, $I(A,T) = 1$ iff $\mathrm{tr}(A)$.[1] The trouble with this resolution of the problem, technically satisfactory though it seems, is that we want the semantics to be applied to tell us when a translation is correct, not to depend on a correct translation or interpretation being fed in at the beginning (cf. Davidson 1967 and 1968–69). There are, as might be expected, devious ways around this problem, the following of which will be adopted: let the universal language contain quotation-mark names of all the sentences of the object language; there is a case for saying that English, as universal language, satisfies this

[1] The translation should, of course, meet certain conditions, e.g. it should be a recursive specification from initial syntactical components, and it should be derivable that, where tr_1 and tr_2 are two translation functions, $\mathrm{tr}_1(A_0)$ iff $\mathrm{tr}_2(A_0)$. Because of the latter, essential, condition, any correct translation will suffice, in particular a trivial one if it can be found.

condition. Let the universal language also contain the predicate of sentence names, "is the case" ("is so", "is a fact", or the like, e.g. "is true"). Define $\underline{\underline{M}}$ as an arbitrary framework M such that, for every sentence A, $I(A, T) = 1$ iff" A" is the case. In short, choose $\mathrm{tr}(A)$ as: "A" is the case. Now it will certainly be objected that the circularity is going to be damaging. But really the situation is scarcely worse than with the identity translation.

At this point it is fair to mention some of the things the semantical account of truth, at least as here represented, is not intended to accomplish. It is not intended to provide a full theory of truth: for example, it says nothing directly about how truth is tested, about methods of verification of statements. It leaves open a great many issues concerning truth, e.g. whether there are different sorts of truth not encompassed, whether there are (or can be) different tests of truth, and if so what they are. It does however provide a substantial foundation on which a fuller theory of truth can be built. For it does define truth for an arbitrary object language. But coupling the semantical theory with surrounding theories such as those of evidence, which complete the fuller theory of truth, is further, and unfinished, semantical business.

10. *Semantical definitions of core, extensional notions: truth and satisfaction*. The problem of determining $\underline{\underline{M}}$ was the chief problem that lay in the way of characterising extensional notions, given that the obstacle course designed by Black 1949, Pap 1958 and others for semantical accounts can be got around.[1]

Recall that given a language, or a logic on a language, L, a class of models with respect to which L is sound and complete is delivered by a universal semantics. Now define the *factual*, real or absolute L-framework $\underline{\underline{M}}$ among these frameworks thus: $\underline{\underline{M}}$ is an arbitrarily selected framework M such that requirement T holds: namely for every wff A of the language, $I(A, T) = 1$ iff A (or, more generally, iff $\mathrm{tr}(A)$) where I is the interpretation function and T the base world of the model M (and $\mathrm{tr}(A)$ is a correct translation of A).

Where A is a closed wffof L, i.e. contains no free variable, A is true (as formulated in L) i ff$I(A, \underline{\underline{T}}) = 1$. To gain comparison with the usually defined notion, "as formulated in L" is often abbreviated to "in L" and is sometimes omitted altogether. There are familiar options as to what to say concerning wffcontaining free variables, e.g. that the

[1] Several of these objections, especially those of Pap, have already been met, in part at least, by Kemeny (see Kemeny 1956, pp. 1–2).

question of truth does not arise, that they are true iffthe universal closures are, and so forth. Another option is to let the metalanguage decide the matter, and to simply drop the restriction, in the definition given, to closed wff. One simple way of taking up the universal closure option is to define A is *true* (in L) as follows: $I(A,T) = 1$ for every factual framework $\underline{\underline{M}}$, where *a* framework is factual iffit meets requirement T. [1]

Nothing in these definitions excludes intensional generalisation of the orthodox Kemeny–Tarski definition according to which a logic guarantees the truth of its own theses. Consider an uninterpreted logic or, where the logic L is interpreted, consider a reinterpretation. An *admissible* translation, atr, for model M for L is a translation function, defined at least from sentences of L into sentences of the universal language, such that, for every sentence A of L, $I(A,T) = 1$ iff $\mathrm{atr}(A)$. Assume, as for instance in Kemeny, that L has an admissible translation for some model. In fact, in view of the completeness of L, there will always be an admissible translation. For let M be the canonical model M_C of L used in establishing completeness and let $\mathrm{atr}_C(A)$ be $A \in T_C$ where T_C is the base world of M_C: then atr_C is an admissible translation. Now define the L-guaranteeing factual model $\underline{\underline{M}}_G$ as an arbitrarily selected model M which has an admissible translation. $\underline{\underline{M}}_G$ is a model of how things in fact are according to L. Then, where A is a sentence of L, A is *true according* to L iff $I_G(A, \underline{\underline{T}}_G) = 1$.

It follows that, for every thesis A of L, A is true according to L. This establishes an interesting, analytic, form of conventionalism: *every theory is correct according to its own lights. But what is true according to L may not be true* – even *in L*. Falsity and non-significance are defined in each case in a parallel fashion. Let the determining model for truth in, or according to, L be $\underline{\underline{M}}_G$. Then A is false ... iff $I_G(A, \underline{\underline{T}}_G) = 0$, and A is non-significant ... $I_G(A, \underline{\underline{T}}_G) = n$.

If a bivalent universal semantics is adopted semantic versions of the two-valued laws of thought are forthcoming both for truth in L and for truth according to L, e.g. no sentence is both true and false, but every sentence is either true or false. With the trivalent semantics suggested, a somewhat different set of semantic formulations of laws of thought naturally emerges: though no wffis both true and false, or both true and non-

[1] Another way, Kemeny's way, is to define A is true in L in terms of A's validity in the factual model structure, i.e. in terms of A's being true on every valuation in the factual model structure, where the factual model structure $\underline{\underline{S}}$ in effect results from $\underline{\underline{M}}$ by deleting I: but use of this definition involves assumptions it is preferable to avoid in a general theory.

significant or both false and non-significant, some sentences are neither true nor false, because non-significant. However every sentence is either true, false or non-significant – a result that would fail if a polyvalent universal semantics which allowed for other values such as incompleteness were chosen. In any case, whether the semantics is bivalent or polyvalent, expected versions of the famous convention T emerge at once, namely A is true in L iff $\mathrm{tr}(A)$ (iff A, in the special inclusion case), and A is true according to L iff $\mathrm{atr}(A)$. Similarly in the trivalent case, A is non-significant in L iff $\mathrm{tr}(A)$ is non-significant (assuming of course that the iffis appropriately 3-valued, i.e. it represents a connective like $\simeq$ of Slog).

The accounts, whether bivalent or polyvalent, can be recast in terms of satisfaction, with satisfaction as primitive in place of truth or with satisfaction defined. For the second option define a satisfaction relation, for example, as follows: a valuation v (or interpretation I) *satisfies* wff A (or makes A hold) *at* a *in* model structure S iff A holds at a on v in S (i.e. in S $I(A, a) = 1$), and v *satisfies* A *in* S iff A is true on v in S. Then A is true in $M = \langle S; v\rangle$ if v in S satisfies A; and A is true iff I satisfies A (in S). Similarly, in the trivalent working example, A is non-significant iff I does not significantly satisfy A.

11. *Semantical vindication of the designative theory of meaning*. Define a *designative theory* of meaning in the accepted fashion, as one which provides "by a general formula, some entity or thing as the meaning of a linguistic expression" (Caton 1971). Then as a corollary of universal semantics (corollary IX to Theorem 2 above):

> Every logic formulable on a free λ-categorial language (and hence every language) has a designative theory of meaning.

For define the *interpretation* of A_α (or what A_α is *about*) *in* model $\underline{\underline{M}}$ as $I(A_\alpha)$, and *the interpretation of* A_α as $I(A_\alpha)$. Since every logic or language (of the specified type) has a semantics which defines an interpretation function I for each model and since a factual model can be distinguished, a designative meaning, in the sense of interpretation, is provided by a general recipe for each linguistic expression of the logic or language. Moreover, to complete the argument for the corollary, meaning so supplied is always an object – on the semantics invoked, a function, and so, in a precise sense, a rule for the application of A_α in every situation and context. In particular, the rule giving the designative meaning of a declarative sentence A_0 holds at a or not (or not significantly). Thus

the designative theory affords a basis for the synthesis of various apparently diverse and conflicting theories of meaning, for example designation theories and use theories. It also furnishes all that has been said to be required of a theory of meaning (cf. again Cresswell 1976, Davidson 1967, p. 7). It does not, however, furnish all that ought to be required from a theory of meaning. For example – except in fortuitous circumstances where the language studied does not include quotational devices or functors with quotational features but nonetheless is rich enough to distinguish logically equivalent expressions with distinct senses – $I(A_\alpha)$ does not provide the sense of A_α, $s(A_\alpha)$, in the expected sense, in which A_α is synonymous with B_α iff $s(A_\alpha) = s(B_\alpha)$. The designation theory has, in short, to be supplemented at least by accounts of synonymy and sense – not to mention such matters as metaphor – before a full theory of meaning emerges.

Interpretation, or "designative meaning", is, in the case of rich languages, a highly intensional notion: the corresponding extensional notion is designation (in the wide, non-intuitive, sense discussed in Slog). The designation of A_α is defined as $I(A_\alpha, \underline{\underline{T}})$, i.e. $I(A_\alpha)(\underline{\underline{T}})$. Hence the designation of a subject term, e.g. of D_1, is an object (in Meinong's sense) and the designation of a declarative sentence, e.g. of C_0, is a truth-value. Thus – apart from the Meinongian slant incorporated through the presupposed neutral metalanguage, and apart from the more complex substitutivity conditions, demanded by highly intensional languages – the account of designation is Fregean. However designation is now but a special case of interpretation, and so also, it will turn out, is sense; that is, both sense and designation are unified through the underlying, familiar notion of interpretation: both designation and sense are restrictions of the interpretation function.

Meaning, whether as interpretation or sense or content, is being explicated then as a function. So much is a commonplace of modern semantics,[1] only the details of the accounts given differ, importantly, e.g. as to the range of languages considered, the types of worlds admitted, and so on. There is another difference however that needs to be entered: the semantics presupposed are not simply set-theoretic, and in particular neither functions nor properties are construed in terms of sets. It is true that the underlying universal semantics can be read set-theoretically and that there are some technical results to be drawn from the possibility of such a construal: but the set-theoretic rendition is

[1] The functional account of intensionality seems to have been glimpsed by Carnap (see MN, where special cases are sketched). The quite general thesis that intensions are functions from worlds to corresponding extensions was apparently proposed by Schock.

not the intended one. Accordingly the universal semantics, properly rendered, can agree with the obvious fact that meanings are not sets, and do not have the right categorial properties to (significantly) be sets, e.g. meanings cannot have members, there cannot significantly be a power set of a meaning, and so forth. Meanings and senses are functions, but not sets, because functions are not all sets, though, of course, each function has an extensional, set-theoretic, representation by way of a set of ordered pairs.

Much of the semantical work of Montague 1974 and his successors is rendered philosophically naive through extensional identifications, through set-theoretical reductions,[1] and the treatment of merely isomorphic structures as if they were identical. Nowhere is this more evident than in the treatment of intensional notions, where meanings, senses, propositions, contents, properties, one and all, are supposed to reappear as sets. The naivety is avoided by adoption of – what is no embarrassment, and involves no great difficulties since a fragment of English, for instance, will suffice – an intensional metalanguage.

Before venturing semantical definitions of sense and synonymy, there are immediate notions in the second tier to consider; and these are, incidentally instructive both because they help show what sort of definitions are unsatisfactory, and because they provide a simpler setting in which to tackle some of the problems that have lain in the way of more satisfactory accounts.

12. *Kemeny's interpretations, and semantical definitions for crucial modal notions*. The classical metatheoretical accounts of modal notions, such as necessity and possibility, run into a severe obstacle in the form of incompleteness theorems and the possibility of non-standard models. In particular, the exact class of necessary truths of arithmetic cannot be captured *classically* by any recursive axiomatisation. Hence an account of logical necessity, intended to include arithmetic, in terms of truth in all models would be inadequate because some necessary truths would be deleted by unintended non-standard models. For incompletely axiomatised theories there are, classically, too many models, so a subclass of models, which Kemeny calls *interpretations* has somehow to be distinguished. Much of Kemeny's 1956 is devoted to marking out interpretations among models, and indeed his new approach consists primarily of a method for distinguishing interpretations (see

[1] For a standard, inadequate, reply to this sort of objection see Cresswell 1973, Postscript, pp. 46–7. The reply fails to meet the objections because there are any number of people who though they know that propositions, for example, are not sets, are not clear what they are.

p. 19). This is at variance with the assumed approach in the case of truth where whatever is true according to the theory is true: why shouldn't whatever is necessary according to the axiomatisation be necessary? But while incorrect axiomatisation of an understood theory is not allowed, incomplete axiomatisation is: "we are forced to allow for models that were not intended as models" (p. 18). For uninterpreted systems there is however no such incompleteness. The underlying vacillation between uninterpreted and already interpreted systems, written into much modern thinking on logical and semantical systems, including Kemeny's, in fact leads to a serious flaw in Kemeny's "satisfactory semantic theory" (p. 19).

Kemeny's new approach is as follows: it is assumed that such object system L is semantically determinate, that is to say that

> in addition to the formal presentation of L we are given (1) one model, M^*, which has been designated for the purpose of translating from L of ML and (2) an indication of which constants are extralogical (Definition 13, p. 19).

Then *interpretations* are defined as those models that differ from M^* only in the assignment to extra-logical constants. Finally, modal notions – and also many non-modal notions, e.g. implication and synonymy – are defined in terms of interpretations. Now according to Kemeny, the author of a system is obliged to select M^*, i.e. the factual model $\underline{\underline{M}}$ (see pp. 2, 13, 14); he is the person who "gives" M^*. Suppose however, to reveal the flaw, the author perversely, or ignorantly, or for other reasons, selects a non-standard model, that we are given a non-standard model M. Then all the interpretations will likewise be non-standard, since they agree with M in assignments to logical constants. As a result the accounts of modal notions err seriously, e.g. the account of necessity in terms of validity in all interpretations can establish as necessary non-standard, and in the ordinary sense "unintended", statements. The upshot is that, as in the case of truth for already (even partly) interpreted systems, the designer of a system is not free to choose the interpretation. He has to choose both M and the logical constants *correctly*: and we are not just given M and a listing of logical constants, we have to be given the right packages.

As with truth there are two cases, that for uninterpreted or reinterpreted systems, and that for languages that are already (partly) interpreted or have intended interpret-

ations. Kemeny's account falls unsatisfactorily between the cases. Consider first the uninterpreted case, or reinterpretation case, *where the system sets its modelling*. Then there are no unintended models, there is no call for a subclass of interpretations. Necessity just is truth in all models. More precisely, extending the "according to" jargon: A is *necessary according to* L iff A is true in all L models, and A is *possible according to* L iff A is true in some L model. Necessity according to L just is validity (or universality, in the sense of Kemeny), and possibility according to L just is satisfiability. By the universal semantics exactly the theorems of L are necessary according to L (contrast p. 23ff.). So any theory can determine what is necessary according to it – another apparent fillip for conventionalism.

The account of necessity according to L conforms to the principle of agreement between the two tiers, enunciated when the two-tier theory was being sketched. The informal connections are as follows:

For every model M, $I_M(A, T_M) = 1$ iff A is necessary
iff $\Box A$ is true
iff $I_G(\Box A, T_G) = 1$
iff, for every world x in O_G, $I_G(A, x) = 1$.

In short, the accounts coincide upon equating regular worlds with models; and the equation appears in order since each subclass is distinguished as that where all theorems hold.

Kemeny would like to adopt an account of necessity (or Atrueness) in terms of universality, but shrinks from it because of incompleteness. He tries to

> assure that interpretations are distinguished from models only insofar as is necessitated by logical incompleteness. If we could make our systems complete, at least in principle, we could identify Atrueness with validity in all models (p. 23).

But (as argued in DLSM), even in the case of richer theories such as arithmetic, incompleteness theorems do not rule out non-classical formalisations, which are in principle at least complete. Admittedly the resulting systems will be negation inconsistent, when thesis completeness is achieved by semantically closing the language, but they need not be trivial, i.e. they may be consistent in Kemeny's sense. It is doubtful, then, that Ke-

meny's reasons for distinguishing interpretations from models hold up once non-classical formalisations are properly considered.

The situation with respect to an interpreted system is different. What is necessary according to a system may well differ from what *is* necessary. Neither correctness nor completeness of a system with respect to its intended models can be assumed. In particular, if M is not a model, only a framework, the assessment of necessity cannot be restricted to models or a subclass thereof. Such a restriction may not be warranted even when L is in order, since the theses of L, though L true, may not be necessarily true. To characterise necessity in this case let us adopt, for want of a better initial strategy, Kemeny's modernisation of the old recipe: true in virtue of its logical form, or, more specifically, true whatever assignments are made to the non-logical constants. The strategy has the serious disadvantage of requiring an advance, and correct, classification of constants into logical and extralogical divisions – a classification, already enjoying some notoriety, which encounters new difficulties when highly intensional languages are modelled, and which the semantical theory so far developed has managed to avoid. An $\underline{\underline{M}}$ *logical variant* is a framework that differs from $\underline{\underline{M}}$ only in the assignments to extralogical constants. A is *necessary* (*with respect to* L) iff A is true in all M logical variants. Hence what is necessary wrt L is true in L, but some theses of L may not be necessary wrt L. What is necessary according to L is not what is necessary wrt L if L is either unsound or incomplete.

Lurking behind the account of necessity wrt L, and likewise that of truth in L, is the ideal of an absolute language-invariant notion of necessity, and likewise of truth. Necessity wrt L is supposed to be assessed in terms of what is necessary – period. Similarly for truth. Once the levels theory is got rid of – a worthy but not immediate objective – there is no bar to language-independent definitions of semantic notions, but it still needs to be shown that the defined terms have appropriate invariance properties, e.g. invariance under translation (cf. Kemeny 1956, §8). Moving outside the orthodoxy of the levels theory does however suggest strategies for improved, less language dependent, definitions of semantical notions, in particular definitions which do away with such devices as the division of constants – definitions which can then be fitted back within the narrow confines of the levels theory. One strategy applies the principle of agreement. Given, what ought to be admissible, iteration of semantical functors, *the problems of invariant characterisation all reduce to the problem*, already tackled, *of characterisation of truth.*

Consider, for example, necessity, A is necessary iff A is necessarily true, i.e. iff $\Box A$ is true. But $I(\Box A, \underline{\underline{T}}) = 1$ ifffor every regular world x, i.e. every x in $\underline{\underline{O}}$, $I(A, x) = 1$. Now apply the principle of agreement. Select a class of *regular* frameworks, one $M(x)$ for each world x in $\underline{\underline{O}}$, as follows: $M(x)$ is an arbitrarily selected framework such that, for every wff B,

$$I_{M(x)}(B, T_{M(x)}) = I(B, x).$$

Then, by the informal arguments, A is *necessary* ifffor every regular framework M in the class, $I_M(A, T_M) = 1$. Given $\underline{\underline{M}}$ the regular frameworks of the class can be defined; and then *necessity* in L can be defined, as above, shortcircuiting the informal verification circuit. A similar strategy can be exploited in the case of other semantical notions. That is, the appropriate second tier can be distinguished, by way of truth, using the corresponding first tier. This is the strategy that will be adopted, not just for necessity, but for such notions as entailment .

13. *Normal frameworks, and semantical definitions for first-degree entailmental notions.* Entailment cannot be adequately defined, even at the first degree in terms of modal notions (see ABE, especially §29.12). The same holds for logical consequence, coentailment and propositional identity. Thus the semantical definitions for these notions proposed by Tarski and others, which are all couched in essentially modal terms, are bound to be defective. To define entailmental notions semantically, models or interpretations are not enough; it is essential to look at frameworks which are not models, where theorems fail – else such paradoxes as that every sentence entails every theorem are unavoidable on the expected inclusion definition of entailment. Given the appropriate class of frameworks, *normal* frameworks, the inclusion definition is simply: A *entails* B (vis à vis L) i ff for every normal framework M, if $I_M(A, T_M) = 1$ then, materially, $I_M(B, T_M) = 1$. The only problem is to define normal frameworks. But this problem has been solved (to my satisfaction at least) in the systemic case (see RLR). Using the principle of agreement, the solution can be transferred (as in §7) to the metalinguistic case. There are two cases, and they are treated similarly. To define entailment *in* L, define a class of normal frameworks $M(z)$, one for each world z in $\underline{\underline{K}}$, as follows:

$$M(z) =_{\mathrm{Df}} \xi M(B)(I_M(B, T_M) = I(B, z)).$$

To define entailment *according* to L, define a different class of L-normal frameworks, using I_G in place of I.

The pattern of definition is the same for coentailment and for what coincides at the first, but not at higher degrees, with coentailment, namely, minimal propositional identity (so at least it is argued elsewhere: see Routley[2] 1975). That is, A is (*minimally*) *propositionally identical with* B (vis à vis L) i ff for every normal framework$M$, $I_M(A, T_M) = I_M(B, T_M)$. (This definition, unlike the entailment definition, suffices for polyvalent cases.) The most plausible objection to this definition is that a class of normal frameworks is not liberal enough, and that additional frameworks are needed to discriminate distinct propositions which use of normal frameworks only would conflate. Technically it is not difficult to expand the class of normal frameworks to various other more comprehensive classes of frameworks, some of them naturally motivated; and philosophically there is, certainly, some basis for the expansion. Where there is a genuine, and conspicuous, basis for the expansion is with such notions as synonymy.

14. *Wider frameworks, and semantical definitions for synonymy notions*. Carnap, Kemeny, Montague and other semanticists have attempted to treat synonymy, like entailment, as a modal notion. For example, Kemeny defines phrases as synonymous if they have the same value in every interpretation (Kemeny 1956, p. 22): according to Kemeny, "this is the weakest acceptable criterion of synonymy". But really it is quite unacceptable, since it makes all necessary sentences synonymous, all logically impossible sentences synonymous, and so on. And even hardened semanticists have realised that such an account is unacceptable and have cast around for alternatives, but what they have come up with is, for the most part, also unacceptable (intensional isomorphism, as in MN, is perhaps the classic example).

A superior lower bound on synonymy is provided by normal frameworks; and an upper bound is given by the class of all frameworks. But the upper bound is evidently too generous in the case of languages, such as natural ones, which contain unsegregated quotation devices or functions, especially when the objective is to define *literal* sense. For example, the synonymy claim, Brother $\underset{\sim}{s}$ male sibling, is often adopted as a paradigm, yet the assertion "The vicar preached an interesting sermon on brothers" does not mean the same as, and does not appear to entail, the assertion "The vicar preached an interesting sermon on male siblings"; and the situation is worse with sentences like "The debate was

about brother earth", where non-literal meanings and associations enter. But meaning in the full sense which includes the non-literal aspects is already accounted for by the interpretation function I. The problem is to characterise sense in the literal sense in which "brother" is synonymous with "male sibling".

In the quest for an account of literal meaning there are optional paths (which tend however to converge) along which to proceed here. One option – the less satisfactory by a good margin – is to start with synonymies written in by the evaluation rules to all frameworks, and to purge the language of quasi-quotational functors, which are to be analysed in terms of explicit quotation later on. This deprives us of direct semantical analyses of quotation and of the rich variety of functors that involve it, and also of direct analyses of the non-literal components of meaning. The preferred option is to have initial synonymies imposed by semantical rules for a proper subclass of frameworks called *wider* frameworks. All the specialised frameworks previously introduced are subclasses of wider frameworks. Then, for every structure label α, A_α *is synonymous with* B_α (vis à vis L) ifffor every wider framework M,

$$I_M(A_\alpha)(T_M) = I_M(B_\alpha)(T_M).$$

The problem is to determine where, between normal frameworks and all frameworks, wider frameworks lie. For, unlike the case of entailment, there is so far no ready-made systemic account of synonymy to fall back upon. Nevertheless the problem is rendered more tractable by shifting it back to the systemic stage. Then what is needed, for each framework, is a class U of *literal* (and non-quotational) worlds, with $K \subset U \subset W$. For initial synonymies, supplied by a dictionary for the language, identical valuations will be supplied for each situation a in U; e.g. if according to the dictionary A_α has the same sense as B_α, i.e. $A_\alpha \underset{\sim}{s} B_\alpha$ is an initial synonymy, then for $a \in U$, $I(A_\alpha)(a) = I(B_\alpha)(a)$. That is, initial synonymies are transformed into semantical constraints on situations in U. The fact that some initial data has to be supplied – syntactically, in the form of dictionary, by way of "meaning postulates" and so on – is no serious limit on semantical analyses: such contingent data as that symbolised in "brother $\underset{\sim}{s}$ male sibling", has, scarcely necessary to say, to be supplied from without. In addition, it is supposed that functors come in two kinds, those whose semantical assessment at situations in U requires no appeal to situations beyond U, and those whose assessment goes beyond U,

quotational functors. Again, the rules for semantic evaluation have to be written in: like the rules for assessing the entailment functor they are determined using (partly) external conditions of adequacy. Providing separate semantical rules for each sort of function in the language is a perhaps tiresome, but inevitable, part of the semantical procedure. With this information, semantical development can forge ahead. The desired underlying metalinguistic distinctions are then recovered from the systemic distinctions by way of the principle of tier agreement. In particular, the *sense* of A_α, $s(A_\alpha)$, is the restriction of function $I_M(A_\alpha)$ to literal worlds: hence when $A_\alpha \underset{\sim}{s} B_\alpha$ then $s(A_\alpha) = s(B_\alpha)$, and conversely.

The syntactical upshot is transparent: quite generally for any parts of speech, if $A_\alpha \underset{\sim}{s} B_\alpha$ ifffor every non-quotational functor $\Phi_{o\alpha}$, $\Phi_{o\alpha}A_\alpha$ iff $\Phi_{o\alpha}B_\alpha$. Most of the many logical properties of synonymy flow from this connection. In particular, synonymy is an identity, an equivalence relation preserving intersubstitutivity in an important class of sentence contexts, non-quotational ones. There are two respects, however, in which this account falls short, as regards contextual variation and concerning interlinguistic synonymy. The semantical theory, unlike its syntactical consequences, can be straightforwardly enlarged to take account of these important issues.

Each model M can be seen as comprising a single interpretation function I and a model structure S, i.e. $M = \langle S; I\rangle$; for interlinguistic synonymy the interpretation function is replaced by two interpretation functors, one for each of the languages concerned. An *enlarged* framework for logics on languages (or languages) L_1 and L_2 is a structure EM of the form $\langle S; I^{L_1}, I^{L_2}\rangle$, where I^{L_1} is an interpretation for L_1 and I^{L_2} for L_2. Observe that the model structure is invariant; so the class U of literal worlds, in particular, does not require re-specification. Then phrase A_α of L_1 *is synonymous with* B_α of L_2 (*vis à vis* L_1 *and* L_2), $A_\alpha L_1 \underset{\sim}{s} B_\alpha L_2$ for short, ifffor every wider enlarged framework $EM = \langle S; I^{L_1}, I^{L_2}\rangle$, $I^{L_1}(A_\alpha)(T_{L_1}) = I^{L_2}(B_\alpha)(T_{L_2})$. The extended systemic connection from which the determination of wider enlarged models derives is: $A_\alpha L_1 \underset{\sim}{s} B_\alpha L_2$ iff, for every a in U, $I^{L_1}(A_\alpha)(a) = I^{L_2}(B_\alpha)(a)$. Naturally, for the semantical analysis to work, initial interlinguistic synonymies have, in effect, to be written in at the bottom: no abstract semantics is going to supply, free, an empirically-determined dictionary which translates initial phrases of one language into those of another. Even semantical magic has its limits. The definition proposed also applies only where the phrase structures of the languages correspond – something that will presumably always happen at least in some

cases, e.g. that of sentences. But languages with radically different syntactic structures, e.g. with different initial structure labels, raise difficulties for the initial specification of enlarged models. Indeed several features of enlarged models have deliberately been left indeterminate, to be taken up more precisely as the semantic art improves. Some smaller margin of indeterminacy in how details are taken up should, in any case, remain as residue, reflecting the fact that the notion of synonymy to be explicated – though clearly different from what most semanticists have supposed it to be – is not sharply delineated one; it is, like sense, a determinable.

The general pragmatico-semantical theory so far developed has another weakness, compensating for which will also be left largely for the future, namely the limited extent to which the theory actually takes account of aspects of context – even if the main technical apparatus is already encompassed in the theory, and each interpretation function I strictly depends on a context parameter among others. The issue of context is important for any theory of meaning and synonymy. For, in one sense "I am hot" said by x means something different from "I am hot" as said by y; but in another sense they mean the same. This can be expressed, in a way that has a substantial basis in English, by saying that the sentences have the same *sense* but different *content*. Thus sense is a semantic notion not changed by changing (non-metaphorical) contexts, whereas content is a fully pragmatic notion for which context can make a real difference. This notion of content, *literal* content, should be distinguished from another notion of content, *informational* content or information, which is an entailmental notion defined in terms of normal frameworks (the logic and semantics of information are studied in UL). Informationally $\sim\sim A$ has the same content as A, but literally they differ. Correspondingly there are two determinate notions of proposition and so of propositional identity, the first degree entailmental notions already introduced which provide the lower bound on the determinables, and notions which amount to literal content and literal content identity that furnish an upper bound on the determinable notions, proposition and propositional identity. The logical determinable/determinate distinction here invoked is explained in more detail in Slog; the leading idea, which has some analogy with that of systematic ambiguity, is however that the one unambiguous determinable notion such as that of proposition or of universality can have several different determinates falling under it (see further §20). The parameter that varies in the case of *proposition* is the variable k in the semantical quantifier: for every k-type framework.

Literal content depends both on sense and on context. For where context c_1 differs from context c_2, $A_0(c_1)$ has a different content from $A_0(c_2)$. To formalise the theory of literal content it is advantageous to introduce content indicators into the syntax (as in Slog), something that can be done definitionally here. Then A_α in context c_1 *has the same content as* B_α in context c_2, $A_\alpha(c_1) = B_\alpha(c_2)$ for short, iff $A_\alpha \underset{\sim}{s} B_\alpha$ and $c_1 = c_2$. Strong identity of content is by no means the only content identity notion of ordinary philosophical interest: contingent identity of content, which also yields a determinant of *statement*, is at least as important. For example "I am hot" as said by x, though not identical in the strong way with "x is hot" as said by x in an otherwise similar context, is contingently identical with the latter.

15. *Solutions to puzzles concerning propositions, truth and belief*. A proposition is an *object*, an object of thought, belief, assertion and other propositional attitudes. The standard case for the introduction of talk of propositions takes the following lines: When two or more creatures believe, think, or assert the *same thing*, they are all related to one and the same object, the proposition in question. The explanation of sameness, which is otherwise problematic, lies in the oneness of the object, the proposition. Propositions are extramental. For, firstly, since different creatures can relate to one and the same proposition it cannot be in, or confined to, the mind of either. Secondly, some propositions have never been thought of by, or otherwise propositionally related to, any creature. Nor are propositions physical- or empirical-world objects. For even if some true propositions can be equated, with some semblance of plausibility, with states-of-affairs in the real world, false propositions cannot. These sorts of considerations, which show that propositions are not mental or physical or empirical-world objects, have commonly been taken – mistakenly – to show one of two things: either, under the influence of platonism, that propositions are the designs of some third realm of entities (thus, e.g., Frege, Popper) or, under the influence of nominalism, that propositions are not objects at all (thus, e.g., Armstrong 1973, pp. 43–4). They would only show the latter if physical and mental objects were exhaustive of objects, which they are rather clearly not. Abstract objects such as attributes are among such omitted objects; and so too are propositions, since they also may be characterised by abstraction.

The theory of propositions to be advanced is an elaboration of that already detailed in Slog, p. 441ff, according to which the proposition *that* A, $\S A$ for short, is given by

a class of context-situations where A holds; i.e. $\S A = \Theta\{a \in K_d : I(A, a) = 1\}$ where Θ is a one-one giving function (the inverse of the interpretation function I), and K_d is a determinable class of context-situations which includes at least all those situations required for the semantical evaluation of entailment. The elaboration consists in the thesis that the term "proposition" is a logical determinable, in the sense explained above in §20. The common covering sense of "proposition", is that shown in the semantical equation linking $I(\S A)$ with a class of context-situations K_d (as in effect displayed above), the determinates falling under the determinable depending on the choice of K_d. Stricter determinates will require a larger class of context-situations, preceding in the limit to the class of all such situations; laxer ones a less comprehensive class, bounded below by the class of situations involved in the assessment of entailment. Thus each determinate sense $\S A$ is given by a *range* of A, different determination corresponding to different ranges between the bounds. The account of *proposition* given merges precisely with the contractional account of proposition in terms of abstraction from an equivalence class of statements, the semantical determinability feature corresponding exactly with the equivalence relation in terms of which the contraction is made (the details are those of Slog, p. 447 and §3.6).

On the theory sketched propositions are functions of a certain sort. Thus propositions are objects since functions are. Furthermore they are abstract objects, distinct from sets (since an extensional reduction of functions is being rejected), which do not exist (since no purely abstract objects exist).

The theory of propositions outlined enables simple solutions to be given to several problems; in particular, how are propositional attitudes such as belief to be explained. The obvious account, which most philosophers find "natural" but go on to reject, is that belief is a relation between a believer and an object, namely what is believed, i.e. the proposition concerned. That is, "x believes that p" is, as it appears, of the relational form "xRy", specifically "$xB\S p$", with $\S p$ the object of belief. According to Russell 1912, p. 193, "the necessity of allowing for falsehood makes it impossible to regard belief" thus. The reason given is that where the proposition is false no such object exists. But existence is not required (nor is it given even where the proposition is true); for belief is an intensional relation, and an existing creature can believe what does not exist, as it can desire what does not exist. Armstrong, following Russell, makes a similar mistake, and claims that "Meinong and others provided false propositions in the world to be the

objects of such things as false beliefs" (Armstrong 1973, p. 44). This is quite inaccurate. Meinong analysed propositions in terms of objectives, and false propositions in terms of objectives which did *not* obtain, and which certainly did not exist. Such objectives were not part of the empirical world. Similarly in the theory given, propositions (though not the same as objectives) do not exist and are not in the physical world. But because propositional attitudes are *intensional* relations, between the holder of the attitude and the proposition at which it is directed, truth of the relation does not require existence of the propositions.

Secondly, it is not difficult to supply a theory of truth meeting Russell's

> three requisites ... which (1) allows truth to have a opposite, namely falsehood, (2) makes truth a property of beliefs, but (3) makes it wholly dependent upon the relation of the beliefs to outside things (Russell 1912, p. 193).

A belief that p is true iffthe proposition that p is true, i.e. iffit is true that p, i.e. i ff$p$. The first connection uses the linkage established between what is believed and propositions, and the latter connections are biconditionals derived from the semantical theory of truth. Then, truth is a property of beliefs (for, the belief that p is true iffthe belief that p has the property of truth, by the general connection: xf iff $x \iota \lambda f$; truth has its traditional opposite falsehood (for a belief that p is false iff, by similar connections, it is not the case that p); and the truth of the belief that p is entirely dependent upon that of p, "the truth of the belief is something not involving beliefs, or (in general) any mind at all, but only the objects of the belief" (Russell 1912, p. 202).

Thirdly, Armstrong's "difficulty for all theories" of propositions, that of giving "an account of what it would be like for the proposition 'Nothing exists' to be true" (Armstrong 1973, p. 49), is no di ffi culty at all for the theory. For the truth of the proposition "Nothing exists" does not imply that an abstract object, namely that proposition, exists, contradicting the claim that nothing exists: true propositions do not exist any more than false ones or other abstractions. The difficulty is an analogue of the traditional "riddle" of non-existence, and, like it, causes no problems for noneism. But surely the difficulty reappears in explaining the supposed truth of the proposition "Nothing is an object"? Not at all; for such a case is impossible: there are no circumstances where the proposition would be true given that propositions are objects.

16. *Logical oversights in the theory: dynamic or evolving languages and logics*. The programmatic semantic theory of meaning, truth and denotation sketched out is evidently short of detail on several important issues, for example, the precise form of the intensional ontologically-neutral metalanguage presupposed, the role of context and how it functions in determining meaning, the constraints on wide frameworks, and the types of ambiguity that the theory recognises. But there are other facets of a full theory of meaning that have been entirely overlooked, in particular all those features that have to do with language change and the dynamic aspects of meaning and designation.[1]

A language is not a static thing, but changes from day to day and from generation to generation. If formal investigations are to get to grips with living language, the static account of a formal language, bequeathed to us by Hilbert's Göttingen group, needs to be exploded to a dynamic account. Present day formal languages and logics can be seen as static sections, momentary snapshots, of evolving, dynamic languages. This fact suggests an initial plan for characterising dynamic languages, in terms of their static instances. First of all a language has, like a person, a lifetime, from time t_1 to t_2 say. At t_1 it is born or created, at t_2 it dies; in between it may develop, flourish, decline. A *dynamic or evolving* (free λ-categorial) language is a symbolic system such that each instant of its lifetime is a static (free λ-categorial) language.[2] This describes, though in an excessively liberal way, a language in the (accepted) symbolic sense. There is much more, of course, to a *natural* language than merely being a symbolic system; such a language may even amount, through associated features, to a form of life in Wittgenstein's sense. But even to capture the symbolic core of a natural language in a formal way would be a sufficient achievement. The trouble with the characterisation suggested is that it allows a structure with a lifetime of three days which is Hindi on the first day, Maori on the second and Swahili on the third, to rank as a dynamic language. Evidently the static components of a language have to be appropriately related; the issue of identity conditions for a language undergoing change has, in short, arisen. The problem is but an interesting special case of the general problem of the identity of things changing over time: almost every feature of a language can change – words certainly, parts of speech yes, grammar, yes – but none may change too rapidly or with excessive discontinuity. Similar problems of identity over

[1] There are other features of language bound up with the full theory of meaning that can however be theoretically separated from it, e.g. issues of language learning, semantic competence, etc.

[2] Since the phrase "dynamic logic" has recently been coopted to distinguish certain static tensed logics, the newer term "evolving" has a point.

time in principle arise with respect to a logic on a language; its axioms and rules can only change in a controlled way – as subject to conditions C, to use some mock-up formalism. A dynamic logic LD on a language is represented by a sequence of logics LD_i on languages over the language lifetime ($t_1 \leq i \leq t_2$) subject to set of conditions C on the sequence. Important as it is to determine conditions C (e.g. from reflection on the general features of languages viewed as extended temporal objects), a determination is not needed for a general semantical analysis of LD; for whatever the conditions they can transfer from conditions on a sequence of static languages to conditions on a sequence of static (basic) models. Then a model for LD is represented by a sequence of models for LD_i. A genuine model for LD, i.e. a genuine model sequence, can in turn be distinguished. It is then a straightforward matter to account, in a rudimentary way, for such matters as meaning change.

17. *Other philosophical corollaries and the semantical metamorphosis of metaphysics.* The main thesis is simply that many philosophically influential reductive positions, when generously construed, furnish semantical analyses whose correctness can be demonstratively established. The treatment of the designation theory of meaning in 11 above affords a classic example: under the wide construal adopted the theory is demonstrably correct; but under a narrower, referential, construal it is false. In short, many wide reductions, taken as semantic analysis, are necessarily true, and thus reconcilable with non-reductionist positions. Where this is so the reductions furnished are not paradoxical, or wrong, but demonstrably correct, and not trivial, though sometimes virtually platitudinous. So results a synthesis of transcendental and reductive positions. (The synthesis is explained and the thesis defended through an array of examples in SMM.) The wide reductions are demonstrable (in such cases) using the universal semantical theory.

What has generally happened, however, is that the reductions adopted are intended to work with a narrower reduction base which fits in with some cherished programme, such as empiricism. Under this contraction of the base, the reductions cease to be demonstrable, and succumb to formal counter-examples and their more familiar intuitive analogues; and it is under these narrow construals that the reductions are paradoxical (in Wisdom's sense). But one important reason why the reductions are so appealing is that they rely on widened, correct, versions of the reductions where further situations are admitted into the analysis. The detailed examples of SMM – of extensional reduction, of

verificationism, of cause as constant conjunction, of reality as appearance and appearance through reality, of the mental through behaviour, of value through preference, and of best choice as maximum utility – elucidate and support these substantial claims.

V. Further evolution of the theory of items

A general, and generous, logical framework for the theory of items has been outlined. But the framework so provided has been applied neither in the semantical investigation of parts of speech not already assessed in quantified intensional logics, nor, of more immediate relevance, to illuminate important features of objects, e.g. what sorts there are, what they are like, how they acquire their properties, and so on.

Two comparisons will help reveal what has been omitted. The first concerns the interwoven (large, ambitious, and rather exhausting) project of furnishing a logico-semantical theory for natural languages, and a semantics for English in particular. Here a logico-semantical framework has been presented, but few are the details so far given as to *how it is to be applied*, how the impressive variety of English parts of speech are to be semantically encompassed within the framework. Some of the desired details are readily derived, some require supplementation of the framework theory. It is evident, to revert to an earlier example, that an adjective A carries different structure labels according as it has an *attributive* role, in which case it takes common nouns (with label 2) into common nouns and so A has label (22), or as it has an predicative role, in which case it takes inflected parts of state and change verbs, notably of the verb "to be", into a predicate with label (01) and its label is not uniquely determined but depends on the verb (e.g. if the label of "is" is always $0(1,1)$ then A's label is $((01)(0(1,1)))$). If further a common noun signifies at each world a class then the interpretation of an attributive adjective is a function taking the class at each world into another class at the same world, e.g. "brown" takes the set noun "n" designates, $I(n)(a)$, into the subset of brown objects of $I(n)(a)$. (Genuinely modifying adjectives always select subsets of the class their interpretation function applies to.) By contrast, the framework gives little guidance as to how such nondeclarative sentences as imperatives and questions are to be encompassed, rather it leaves a range of options open (e.g. all the reductionist options canvassed in Cresswell 1973, and the more satisfactory option not there considered of assigning separate structure labels to these distinctive sorts of non-truth-valued sentences).

A glance at the contents of Cresswell's *Logics and Languages* 1973 illustrates the first point nicely. The essential logical and metaphysical details of Cresswell's parts I and II have already been covered in §24, and a more comprehensive neutral framework given. But comparatively little of Cresswell's parts III and IV, on English as a λ-categorial language and as a natural language, have been explicitly treated in a noneist fashion. Most conspicuously, little detailed semantical analysis of parts of speech, has been presented although all the theoretical apparatus required has been supplied, and though in fact *some* of the analyses now available in the literature can be readily adapted. Indeed much can be accomplished in the elementary, perhaps at first sight trivial, but still informative, way the example of "brown (22)" illustrated. Since the basic parts of speech have been accounted for (more or less), consider for instance a part of speech A with structure label $(\alpha\beta)$: often the interpretation of A can be given as that function $I(A)(a)$ of A at world a which applied to an object of type β at a yields the A (restricted) object of type α at a (i.e. the relation interpreting A reduces to the A-function).

The second comparison is very different and more to the point. Although an abstract map of Meinong's jungle has been sketched, revealing some of the structural geography, not many are the details that have been given of the inhabitants of the jungle. It is time to make amends, beginning with a survey of the inhabitants.

§25. On the types of objects.

The aim of the comprehensive theory of objects is to include, and ideally to characterise at least in part, *every sort* of object – not just deductively closed objects (as on a very early version of the theory of items), or else certain deductively open objects, but both.

Though almost all philosophers try to severely restrict the class of objects they are prepared to consider or talk or think about or take account of in their theorising, it is very much in the spirit of the theory of objects to investigate *all* types, and there is neither need nor good reason for restrictions on the types. No object then should be beyond the range of the object variables of such a theory: the theory should, in a good sense, be about every thing – (just as *this text is* intended to be, in principle at least, *about everything*). Thus, inasmuch as paradoxical objects and radically inconsistent objects are objects,[1] a theory should be about such objects, among others; but it may

[1] This is of course a contentious claim. Meinong, for example, was in doubt as to whether paradoxical items are objects: see chapter 5.3 [reprinted in Vol. 2 —*Eds.*].

refuse of course to ascribe all expected features to such objects, and will have to do so unless paraconsistent. The fact that all objects are included in the theory says nothing furthermore as to their roles or their importance: many of them will no doubt be quite unimportant and have no philosophical role, but some are very important and have major mathematical or theoretical roles (see chapter 10 [reprinted in Vol. 3 *—Eds.*]).

The classification of objects which follows is relatively poor by comparison with Meinong's rich phenomenological classification of objects. Thus, for example, nothing much is said of immanent objects or auxiliary or ultimate objects or for that matter of sense data – for reasons that should become clear by chapter 12 [reprinted in Vol. 3 *—Eds.*]. Some of the classifications of objects that are made have already been adopted, others will be adopted (and the basis of various classifications will be further investigated in later chapters [reprinted in Volumes 2 and 3 *—Eds.*]):

1. *Modal (and ontic) status.* Objects divide exclusively and exhaustively into *existent*, *(merely) possible*, and *impossible* objects. Subsequently when temporal differences are taken account of (in chapter 2 [reprinted in Vol. 2 *—Eds.*]) this classification will be elaborated: at that stage *existing* and *sometimes-existent* but not existing objects are separated. With the introduction of time and tense many other distinctions emerge, e.g. that between past and present and future objects.

An important division of possible objects is into *consistent* objects, such as abstractions, which in a good sense could not possibly exist, and *possibly existent* objects, such as particulars which in other possible worlds do exist.[1] A logically important subclass of impossible objects – which on an alternative and rather tempting classification are isolated as a separate group – consists of *paradoxical* objects, that is of objects such as the Russell class, the impredicativity property, the Liar statements and so on, that generate logico-semantical paradoxes.

Cross-classification of objects tying with modal status have also of course been invoked, e.g. the distinction between *complete* and *incomplete* objects. One cross-classification of especial importance is that in terms of:

2. *Abstraction status.* Objects divide into *particulars* and *abstractions*, i.e. abstract objects or universals. Particulars may be divided, roughly at least, into *individuals* and

[1] The distinction corresponds, very approximately, to Meinong's distinction between "real" objects and ideal objects (see, e.g. GA, II, p. 77).

complexes. Abstractions, which are ultimately abstracted from particulars by abstraction conditions, divide into a wide variety of objects, e.g. propositions, properties, relations, functions, classes, worlds, states-of-affairs, objectives.[1]

Some of these distinctions, e.g. that between individuals and complexes (i.e. units composed of individuals such as forests and bands) are disturbingly soft. For example, most individuals, save perhaps the ever-retreating ultimate physical particles, can be viewed as complexes, and conversely complexes can be viewed as individuals. It is for this sort of reason too that no excessive weight should be placed on Meinong's valuable cross-classification of 2,[2] namely:

2′. *Order status*. Objects divide into *lower* or bottom *order* objects, individuals or ground floor objects, which are not dependent on further objects, and *higher order* objects which "depend upon" lower order objects.

These are by no means the only divisions of objects that have been used or that are profitably made. Another useful but none-too-sharp distinction, for example, is that between *theoretical* objects, the objects of theories (whether true or false), usually scientific theories, and *fictional* objects, which (on more modern construals) include the objects of fiction, myth, legend, and so on. (The distinction is further considered and sharpened in chapter 7 [see Vol. 2 *—Eds.*].) The division is often taken, somewhat erroneously, as one of subject matter; this at least accounts for the apparent fact that the division becomes hazy where the subjects run together, as in more theoretical fiction and around the less reputable periphery of the sciences extending out to the areas of magic, alchemy, myth, and so forth. Fictional objects are primarily, but by no means invariably, particulars, whereas theoretical objects are often, but by no means always, abstractions, as are, e.g., the principal objects of mathematical investigation.

A notable feature of *mathematical* objects[3] – those of mathematical theories and the subjects of mathematical investigations – and, more generally, of theoretical objects,

[1] Reduction attempts which accept classification 1 typically try to reduce the nonexistent particulars of classification 2 to abstract objects. Some of these attempts are assessed in chapter 12.4 [reprinted in Vol. 3 *—Eds.*]: they are invariably failures.

[2] Despite the remarks here and early in the book about this distinction, it is applied in a rough and ready way, often enough in the book (see also 12.2 [reprinted in Vol. 3 *—Eds.*]).

[3] This is, obviously, another disciplinary division, and as such of no more merit that the separation of disciplines upon which it rests.

is that they are *deductively* closed, or *deductive*, or *d-closed*, objects; that is, where a is such an object, if (being) h is a logical consequence of properties a has then ah.[1]

By contrast, there is often no basis for assuming that a fictional object is deductively closed (in fact source books for fictional objects generally do not guarantee deductive closure). Such objects which are not d-closed are *open*, or d-open, objects. Here lies a fundamental division (if one still relative to the underlying theory of deducibility), that in terms of:

3. *Closure features.* Closure can occur under a variety of relations or operations, but perhaps the most important case is that of deducibility. *Properly theoretical* objects are closed under deducibility. It is a mark of a purely *scientific* theory that it is closed under deducibility, just as it is a mark of such a theory that it is *eventually* falsifiable; and deductive closure of objects follows from deductive closure of theories. For if ah and h entails g according to the theory then ah entails ag, whence ag by theory closure. It is a consequence that the theory of items presented in this book is *not* a *purely* scientific theory.[2] For not all the objects to which it applies are deductively closed, various objects of fiction for example are not.[3] Worlds again offer some valuable guidance as to the division of objects generally into deductive and nondeductive. For an important class of worlds (beyond K) is not closed under provable entailment; some of worlds of imagination and likewise worlds of fiction are like this (see 7.8ff[reprinted in Vol. 2 —*Eds.*].)

4. *Descriptive features.* Meinong remarks that an object of thought can be treated

> as "closed", in which case it, not only *has* no further properties, but is *incapable* of having any. ... In general, however, we treat objects (at least those) of the form "something that is so-and-so" as if they were "open", not "closed"; that is we leave blanks in their constitution which we fill up as we proceed (Findlay 1963, p. 157).

[1] Entailment and logical consequence of properties are defined in the expected way, e.g. (being) f entails (being) g iff, for every x, xf entails xg.

[2] It is a consequence that the reader may view with joy or alarm according to his philosophical disposition and preconceptions. A logical theory is infected by some of the data it endeavours to take account of. Some perfectly respectable theories are not scientific. For example, a purely logical theory, all of whose theses are analytic, is never falsifiable. And such a theory may far surpass actual scientific theories in methodological features that are sometimes made much of – especially in statements as to "the scientific outlook" – such as exactness of statement and postulates, rigor, effectiveness, etc.

[3] Central parts of the theory are however intended to be closed under a good deducibility relation. But parts, e.g. the paraconsistent parts, are not closed, and not intended to be closed, under material or strict consequence: that it is not so closed is no valid criticism of it.

But as Findlay further remarks the view of "filling up" as not affecting identity is "a loose one" which Meinong afterwards rejects.

There are significantly different distinctions here which it is easy to conflate. Firstly, there is often a *descriptive openness* in a description of an object. Recall the red-headed man of §14 and §22. The ordinary description "the red-headed man" is open to elaboration, but in ways that are sharply delimited by features of the (already) constituted objects. But if the description is a description of the pure object the *red-headed man* then it is not open, but *descriptively closed*. This distinction calls for a comparison between a description and a constituted object, so it does not really provide a classification of objects as of the way they can be described, more or less completely.[1]

Secondly there are progressively-selected objects, which acquire further features by further selection. Someone thinks of something, then something blue, then something blue which is heavy. Again, to avoid conflict with the logical theory, especially of identity, this is best viewed not as a further determination or "filling up" of *an* object but as progressive selection of object. Again it does not provide a further type of object.

Thirdly, however, there are evolving objects, which do change their features. To avoid damaging inconsistency this is best regarded as occurring over time. Then the one object does not both have and lack a given extensional feature, but has a feature – at one time but not at another. Thus objects can be distinguished in terms of

5. *Change status.* Objects separate into evolving or *dynamic* objects which change, and fixed or *static* objects which do not. The pure object, the round square, like most abstractions, is a static object. But all entities and most fictional objects are dynamic.

It is as regards evolving objects, not fixed objects, that it is legitimate to speak of the *actualization of possibilia*. Possibilia are sometimes actualized. During the writing of the first version of this chapter, in a country town environment, a hotel was erected on the opposite corner. Even if (as was unlikely) the hotel was built rigorously to specifications, there are so many matters left open in plans (which supply a main component of the source books for buildings) that there are very many possible hotels that the hotel on the opposite corner *could* actualise. Which possible hotel, or hotels, does it actualise?

[1] Objects also differ as to how they may be *conceived*, especially in what classes of features are ascribed to them. Contrast *full* objects which are conceived of as having all their features, with various *stripped* objects which have (i.e. are conceived of in this way) only some of their features, e.g. extensional features.

On the one hand it seems that the answer should certainly depend on actual features of the hotel $\hbar$ built, for it is this that is the actualised result. On the other hand it seems that it should have something to do with the (varying) intentions of the architects and others who designed it, so long at least as the result did not diverge too far from the plans. But there is no one ready-made answer to the question: the issue is a conflict one calling for decision. One resolution, perhaps the best, is this: The hotel $\hbar$ actualizes all those possible hotels whose features, as provided by their characterisations (i) include the characterising features of the specifications of $\hbar$ that are consistent with those of the actual $\hbar$, discounting features in the specifications that $\hbar$ does not have, and (ii) are included in the features of the actual hotel $\hbar$. Thus the actual hotel will actualize at least denumerably many possible hotels. It cannot of course actualize any impossible hotels, e.g. hotels with both fifteen and sixteen bedrooms. If hotel $\hbar$ has, in accord with its specifications, fifteen bedrooms, seven showers, one lift, is painted red, etc., then $\hbar$ actualizes only possible hotels that have these features and no extensional features that $\hbar$ does not have. But $\hbar$ does not actualize any possible hotel with two lifts, or any other actual hotel. More generally, e *actualises* d iffthe characterising features of d include those in given specifications or blueprints (if any) for e before e comes into existence that are consistent with those e has, and the extensional features of e property include those of d. Thus what e actualises are possibilia.[1] The presupposed notion of coming into existence is defined in chapter 2 [reprinted in Vol. 2 *—Eds.*], where also many other problems and issues concerning dynamic objects and their logic are considered.

§26. Acquaintance with and epistemic access to nonentities; characterisations, and the source book theory.

Both Meinong and Russell distinguished two main ways of designating and acquiring knowledge of objects: first, by acquaintance and ostension, and second, through description. For nonentities they both thought that only the second possibility is open – or at least that coupled with limited description-ostension devices such as pointing and adding "Like . . . , but . . . ". It may then be tempting to conclude that (unless perhaps some items are undescribable) if b does not exist, then some description is a correct description of

[1] The theory of items gives promise of providing an interesting formal treatment of other Aristotelian notions, in particular those of Aristotle's theory of potentialities. For potentialities are special sorts of possibilities of actual items.

b. But both the premiss and the jump to the conclusion are mistaken. Firstly, so it will be contended, knowledge of nonentities may be obtained by a range of cognitive procedures, e.g. perception, imagination, dreams, memory, inference. We encounter nonexistent objects all the time in our intellectual and imaginative activities and sometimes in perception (see especially 7.10 and 8.10 [reprinted in Vol. 2 and Vol. 3 respectively *—Eds.*]). It is simply false that descriptions are all that are available in discerning nonentities: they are only all that is available in describing nonentities, since analytically all describing is by description (in a generous sense). The ostension/description dichotomy is a false one, even as restricted to the explanation of objects to others. Secondly, only a few among objects are ever described: many nonentities will lack any actual descriptions, correct or not. But they do not thereby lack constitutions or natures.

Observe that a distinction can, and should, be made between the characterisation of (nonentity) *b* and characterising descriptions of *b*. A *characterisation* may be viewed as a liberalisation of the traditional notion of an essence: a liberalisation because a characterisation need not be bound by necessary and sufficient conditions, but can be open in the various ways Wittgenstein 1953, Waismann 1953, and others have remarked in their criticisms of certain essentialisms.[1] A characterisation may be represented (for example) by a fuzzy set of characterising properties.[2] Naturally characterisations (like other abstract objects; see chapter 9 [reprinted in Vol. 3 *—Eds.*]) do not exist, any more than many of the objects they serve to characterise. Nor do objects reduce to their characterisations, though the idea of such a reduction has appealed to some philosophers (those of reductionist temperament who like to convert what are limited isomorphisms into identities). For objects have (categorially) different properties from their characterisations (as shown in later chapters, especially 8 [reprinted in Vol. 3 *—Eds.*]). The difference can be readily seen in the case of entities. Smart has a characterisation but is not a characterisation; joviality is not an element of him, though it may be of his characterisation.[α]

[1] Such openness interferes with identity criteria neither for entities nor for nonentities. (It may interfere, however, with the application of such criteria.)

[2] Characterising properties are those that are specified by characterising predicates (both those that have tokens and those that do not but might).

Through an appropriate fuzzy set theory lies a ready way of taking account of several sorts of openness, and thereby of rebutting the common charge (made recently by John Passmore) that a theory of objects is bound to be (objectionably) essentialistic.

[α] The reference here is to J. J .C. Smart, philosophical colleague and frequent bush-walking companion. *—Eds.*

One of the by-products of attempts at linguistic reductions of nonentities, of nonentities or their characterisations to (characterising) descriptions, has been a decidedly misleading picture of nonentities, as if they were mostly, or all, relatively simple finite-sided objects. Such commonly ascribed features can be accounted for by the fact that natural language descriptions are necessarily finite. Any such linguistically specified nonentity, if it were only reachable by description, and exhausted by description would be limited to characteristics that can be finitely specified, and consequently will be incompletely specified with respect to all sorts of features, and generally finite-sided. Thus the renowned, but bogus, contrast between the almost infinite complexity of entities and the incompleteness and "shadowiness" of (linguistically specified) nonentities. The contrast is bogus because we are not limited to finite descriptions in finding out about nonentities, but have many other means, nor are we limited to the finite by finite descriptions used in characterising them, any more than we are similarly limited to finite cardinal numbers.

Much as a character in a work of fiction is characterised in the book, so more generally an object may be said to be characterised in a source book for it, or its characterisation given by a *source book*. For each object there is a source book which tells its "story" what it is like, what it does, and so forth. The source book is the *source* for characterising details of the object: it is not the source, of course, for what we think or feel about the object, for all intensional relations to the object. Any actually *specified* nonentity does have an actual source – whether it consists of what is written in books or documents, verbal or film material, or is in the form of plans, blueprints, specifications or the like. All these sources will be accounted source books or part of source books in the technical sense. For example, building specifications may function as the source book for a house which does not exist (and which may never exist). The role of the source book for an object in determining what is true or false of the object is explained by direct elaboration (with very minor adjustment) of Honoré's account of the role of specifications in characterising a projected house.

> Provided everyone understands we are not postulating the existence of the house we can happily say "our new house has four bedrooms","I wonder if we have put the staircase in the wrong place", and so on, without fear of misunderstanding or of having failed to accomplish a proper speech act. The statements we make about the house may be true or false. If the specifications provide for four bedrooms, "it

> has four bedrooms" is true and "it has five bedrooms" is false. In fact the specifications define the house. All that can be truly said about it must be continued in them or drawn from them by implication [in a *very* generous sense]. If the plans are changed the house changes (Honoré 1971, p. 304).[1]

Likewise, so it is commonly and truly said, whether "Holmes smoked a pipe" is true or false according as it is specified in the source book for Holmes, which is *compiled* from Holmes' stories, whether he did or not; and it is true since it is specified that he did. Like specifications, source books can be vague or indefinite on various questions (compare a manuscript with some illegible or fully erased sentences). Like specifications also, source books may vary over time; and in a similar way one can speak of the source book for d at a given time, and the complete source book for a over all time. Some source books are closed, as is the source book giving the specification of Alice's unicorn, while others are presently open in that they may be continued. Some source books too have sequels. In such cases, the nonentity changes, as its specification or characterisation changes.

The account of truth determination by source books has to be a little more sophisticated, however, as does the account of source books, which are ideal extrapolations from actual books. For suppose the source books say, that Holmes exists, or the plans say that the building is to be found at a given location, when neither of these things are true. (Examples are easily multiplied: see 7.1 [reprinted in Vol. 2 *—Eds.*]). What will be said instead is this: The source book delineates an object with such-and-such features. In the world of the source book (the world determined by the statements of the source book), the object *has* these features. But which features it in fact has, has in $\underline{\underline{T}}$, as opposed to in the source book world, depend on its characterising features, and these features it does have (in $\underline{\underline{T}}$) as Characterisation Postulates assure. Thus a source book includes, like a story, much more than merely the characterising features, of its object.

Even in the paradigmatic case of a character portrayed in just one novel, the source book may not – generally will not – coincide with the novel, but will add to it statements that are not made in the novel but can be reliably inferred from the novel and are required in understanding it (cf. 7.1 [reprinted in Vol. 2 *—Eds.*]). In other cases the source book

[1] What Honoré goes on to say (p. 304), that "non-existent objects are not phantom objects but represent the content of specifications or descriptions", amounts however to another mistaken reduction attempt. All that is true is that nonentities may be regarded as given by source books (or worlds); but in most cases the source books themselves will not exist.

for a fictional-object may depend upon several works in which the object figures.[1] The source book for a theoretical object will depend on a theory or complex of theories, which will provide part at least of the source book. The source book for an historical figure, for instance for Parmenides, is determined by how things were; by contrast our *record* will be compiled from a small set of writings, from what is said about the figure, and so on; in short, from the historical sources concerning the figure, that is, with what the historian works with.[2]

A source book, or source theory, like the world it delineates, may be represented by a set of propositions, some at least of which may be presented in a book (cf. the book of fate). For a nonentity no one has selected for consideration but few or none of the requisite propositions will be documented in any actual historical source. The source books of such objects are not actually-grounded. By contrast, the source books of nonentities that have been selected for presentation, consideration, etc., e.g. the objects of fiction, mythology and theories have *actually-grounded* source books.[3]

A corollary is that actual source books[4] or elaborations thereupon offer no viable route for a reduction of nonentities. It would be wrong to conclude that objects always answer back to source books which a referentialist can say exists. For there are many tales that are never told, etc. In other words, the situation is like that with propositions and real numbers. Told stories are like stated propositions or described really numbers; and untold stories – objects whose source books have not been set down in part – are like unstated propositions or undescribed or unselected real numbers (cf. undescribed species). Furthermore just as there are very many real numbers that remain unselected and many propositions that are never stated in any noninfinitary language, so many stories remain untold, many objects and characters are never selected. The numbers can be estimated. Even for real numbers the cardinality is non-denumerable. For propositions the cardinality is at least as large, for there is at least one proposition concerning each undescribed real number, namely that it is undescribed. In fact the cardinality is far

[1] Also a work of fiction is generally about several objects and more than one character.

[2] It is assumed that a source book is, like a work of fiction generally is, reliable as to its object(s). With past objects – as contrasted with perhaps future objects, such as Honoré's house – where records diverge from source books, the question of reliability does arise, for records; and it turns on comparisons of records and putative source book material.

[3] Thus Anna Karenina has an actually-grounded source book. The point enables Howell's second objection to Parsons' theory (Howell 1979, p. 133) to be met immediately. The source book theory also helps in meeting other of Howell's objections.

[4] Really those that have actual tokens.

larger since there is at least one proposition concerning each number, namely that it is a number. So there are at least as many propositions as ordinal numbers. But there can be no more for the number of propositions has a number and this can be no larger than the number of numbers. So the number is the number of numbers.[1]

The source book theory, as well as being invaluable in reflection upon fictional objects, offers a theoretical solution to the issue (which prompts "negative" CPs) as to which characterising properties it is *not* the case that objects have. The answer is: those that are not given in their source books. The source book theory also helps in explaining, what it was originally introduced to explain, the fact that many claims about nonentities are contingent, enough of them contingent truths. When only CPs are considered, this may look like a problem, since all truths so delivered about nonentities are necessary. It is not difficult to see however, especially given source books for nonentities, that intensional statements about nonentities are mostly contingent. The difficulty lies with extensional truths.

The key point is that source books are contingently source books for the named items, i.e. it is contingent that the source book for Sherlock Holmes is the one it is. Sherlock Holmes might have been a negro born in the U.S.A., in which case the source book would be rather different. So it is contingent that Sherlock Holmes has even the characterizing features ascribed to him by the source book. But how is this compatible with the necessary truth supplied by a CP that the man who did all the characterising things SH did (necessarily) did all these characterising things? The identity of SH with the man who did all the things Holmes did ... is extensional, and replacement of extensional identicals does not preserve modality; so what the identity will yield at best is that what is true is that SH in fact did all these characterising things.

§27. On the variety of noneisms.

Basic noneism is the position which integrates into a logical framework the theses M1–M7

[1] This is however in the region of Cantor's "paradox". And with the questions as to the number of source books we are in it. For consider the issue as to how many theories there are, noting that a theory can be represented as a set of propositions. The number of theories is (at least) 2 to the power of the number of propositions, that is 2^{NM}, where NM is the number of numbers, giving a number 2^{NM} strictly greater by Cantor's theorem than the number NM of numbers. NM is an inconsistent number, indeed a radically inconsistent object. On the paraconsistent theory such objects are unproblematic.

(set out on p. 3) and other theses drawn from the Epicureans and Reid (see pp. 1–3), in particular,

M8. Universals do not exist but they are something.

In order to include such theories as those of Castañeda 1974 and Parsons 1974, requirement M8, which may look more optional than it is, would have to be removed. So results what may be called "minimal noneism". But noneisms extending minimal noneism which replace M8 by the contrary thesis that some (or many) universals exist (as do both Castañeda and the earlier Parsons) are not really noneisms, but reductionist positions (see especially the argument of chapter 12 [reprinted in Vol. 3 —*Eds.*]). For such theories commonly admit, or are intended to admit, the reduction of nonexistent objects to (allegedly) existing universals (those the theory includes).

As soon as noneism is applied to resolve philosophical problems extension beyond the basic (or minimal) position is rather inevitable. For example, when the issue as to what can be conceived is considered, the upshot is (as Reid found in investigating the intellectual powers of man),

M9. It is false that whatever can be conceived is possible.

an upshot contradicting the opinions of almost all philosophers, but not of the ordinary man (Reid 1895, p. 369). At this point the commonsense features of noneism begin to appear: just how commonsensical the theory of items is is argued in chapter 6 [reprinted in Vol. 2 —*Eds.*].

There is a more general position that application of basic noneism encourages, namely *commonsense nonreductionism*. It is in part for this reason that it is seriously suggested that "noneism" can also be considered as a contraction on "nonreductionism". Basic noneism leads to nonreductionism, in the first place, because reductions are very often ontologically motivated. They aim to show that such and such objects whose existence is thought problematic but which are somehow required for a certain theory or discourse, can be reduced, or the theory or discourse in which they occur reduced, to an alternative (less problematic or) unproblematic basis, at the same time revealing that the objects in question either do not exist, or, though they do exist, are nothing importantly over and above things that do unproblematically exist. Theories of incomplete symbols provide reductions of the first sort, putative scientific reductions of the second sort, e.g.

the physicalist reduction of minds to brain states.[1] The noneist finds however that the allegedly problematic objects, though indeed required for certain discourse, do not exist and have only been thought problematic because of referential assumptions that noneism rejects, and hence that the motivational bases for attempted reductions are removed: the objects may be contemplated, thought about and theorised about without ontological extravagance. The noneist also finds, on further investigation, that very many of the reduction proposals are extremely shaky and furthermore depend, for what little chance of success they have, upon assumptions antipathetic to noneism. In sum, an excellent case emerges, for rejecting such reduction proposals (see further chapter 12 [reprinted in Vol. 3 *—Eds.*]).

A fuller noneism is nonreductionistic in orientation, at least in rejecting such ontological reduction proposals. Fuller noneisms also develop noneism beyond the basic theses towards more comprehensive philosophical theories. Roughly, a *fuller* noneism – or simply *noneism* in what follows – is a conservative extension of basic noneism which rejects many philosophical reduction proposals (including those for reducing universals); thus fuller noneism is also nonreductionist noneism. It is also, as hinted and as it turns out, a commonsense position. It is difficult to be precise about exactly which reduction proposals noneism repudiates. Certainly not all scientific reductions proposals are being rejected; enough of these have turned out correct, e.g. the extensional identity of water with H_2O, of heat with a form of energy. But several sorts of philosophical reduction proposals will be encountered and rejected in subsequent chapters, e.g. phenomenalistic reductions of material objects to ideas, of theories to phenomena, etc. The scientific/philosophical distinction thus far leant upon will, however, bear scarcely any weight, and needs superseding. Similarly, what counts as a development is (deliberately) left vague: later chapters will illustrate some developments and indicate lines of other possible developments.

There are many lines of development of basic noneism. Enough of these choices have already been considered in detail, e.g. choice of descriptors and descriptor semantical rules, choice of quantifiers (whether LQ or LR style), extent of modalisation, extent of relevantisation, etc. Some of the choices between alternative lines are fundamental to the

[1] The falsity of many variants on the contingent identity equation, minds = brains, will follow from the theory of chapter 9 [reprinted in Vol. 3 *—Eds.*]. For brains exist, but minds do not exist, and "exists" is transparent with respect to contingent identity.

character of the theory and to the shape of its logic. Perhaps the most difficult and most far-reaching choice is that between *consistent* and *paraconsistent* noneisms. Consistent noneism is intended to be a consistent theory, and is presented as such. If the theory is found inconsistent it is either abandoned or else modified, in a way intended to remove source of inconsistency. Paraconsistent noneism allows for the possibility that the theory is inconsistent, and does not abandon or necessarily modify the theory if inconsistency is found. Consistent noneism aims to provide a consistent theory of inconsistent objects, paraconsistent noneism does not; and a dialectical, or inconsistent, noneism may explicitly aim to give – what may look more appropriate – an inconsistent, yet nonetheless nontrivial and sensible, theory of inconsistent objects. The choice between these types of noneism is (once paraconsistent theories are taken with due seriousness) a difficult one: as we shall see (particularly in chapter 5 [see Vol. 2 *—Eds.*]), each choice has its advantages and also its disadvantages, and an informed choice is at present hampered by lack of information, especially as to what can be accomplished in paraconsistent logics.

Consistent and dialectical noneisms differ in the properties they assign to impossible objects, in particular as to the sorts of impossible objects the theories include, something which depends upon the strength of Characterisation Postulates for impossible objects. More generally, noneisms differ, often importantly, as to the *types* of objects the theories provide for, the *varieties of properties and relations* these objects have, and the *inferences* it is legitimate to make from their having these attributes. These are differences that come down in a full formalisation of a theory – something the present, partly genetic, theory of items does not entirely achieve, or, at the current early stages of logical investigation, really aspire to – to *logical* differences, to differences in such logical and semantical matters as the following:

(i) The range of values of the variables, especially the bound variables, of the theory, and associated with this the extent of domain $d(\underline{\underline{T}})$, and, syntactically, the width of the class of terms that can instantiate the most general variables of the theory. This issue is a special case of the next issue:

(ii) The form of the underlying neutral logic, the carrier logic, i.e. the theory of implication and inference and the logics of parts of speech such as connectives, as distinct from the theory which specifies objects.

(iii) The axioms for objects of the theory, in particular the extent and type of Characterisation Postulates.

(iv) The theory of attributes and of classes of attributes of the logic, in particular the classification of properties and relations.

Theories of items may differ significantly in each of (i)–(iv); and it seems likely, that with the growing interest in such theories that logics of items will proliferate. Yet there is relatively little doubt where such logics should be tending, at least as regards some of the issues raised by (i)–(iv). Firstly, to consider (i), a logic of items should include as values of variables all objects, including all objects of thought, imagination, and so on. That it needs to do so to satisfy thesis M1 is not however entirely evident; for *thing* (in "everything is an object"), on *one* common construal, means "particular thing" and thus excludes objects of higher order. And a logic may build in, as second-order logic does, a crude typification under which attributes, for instance, which are objects and objects of thought, are excluded as things. But in the intended reading of M1, a reading enforced by the elaboration made as to the sorts of objects, *thing* is *not* so restricted. Higher order objects are objects, certainly, and also things (on the intended reading, and on a perhaps even more common construal of "thing"). Thus neutral second-order logic, though a satisfactory logic for an important fragment of the theory of items, has to be superseded by a more comprehensive logic which places no such type restriction on objects. Such a logic structural logics can furnish.

Consider next issues raised by (ii). Ultimately a logic for noneism should include provision for all parts of speech natural languages may contain, and especially all connectives that may license inferences. For any part of speech may figure in a complex substantial phrase, and any such phrase may be used, with the intention at least, of presenting an object. So all parts of speech should be encompassed. In short, an eventual objective, which structural logics carry one far towards (as far as general format is concerned), is a logic adequate to discourse, a logic with a comprehensive grammar and semantics.

Consider finally (iii) and (iv). Again the eventual aim is a certain maximality, severely constrained maximality needless to say. For example, a theory that leaves out certain sorts of objects (as a consistent revision of noneism perhaps does) will be less adequate, at least in this regard, than a theory which does not. Again, a theory which

blocks relations nonentities can have to one another, or the inferences that can be drawn from such relations, by its account of relations (as does Parsons' theory), is less adequate than one that does not. Naturally there are limits to this maximalisation. It is not to be achieved by trivialising the logic. Nor is meant by talk of classifications of relations endless multiplication of distinctions which are going nowhere of theoretical or taxonomic importance (which is what one sometimes seems to find in Meinong's work).

On the different roads to ultimate objectives there are many staging points. Different logics will result inasmuch as a theory of objects is taken as far as one or other of these staging points. So results a lattice of logics, with minimal elements corresponding to minimal and basic noneisms and maximal elements to ultimate noneisms. The class of logics is very large, and choice among the alternatives, so far as it is required, often a difficult business.

A choice associated with the paraconsistency choice – since relevant logics comprise an important class of paraconsistent logics – is the ir/relevance choice, whether the underlying logic of the theory is to be relevant, or irrelevant, e.g. classical or an extension of classical such as modal. A *relevant* noneism is one whose logical theory is a relevant one (strictly, one whose theory is a conservative extension of a relevant logic, something that it is hard to be sure of with complex theories).

The relevant/modal choice (with its associated arguments as to the correct substitutivity conditions for a wide range of philosophically important functors) may be seen as a special case of the ultramodal/modal choice. (Remember that classical substitution conditions are usually modal, being defined in terms of valid or logically necessary material equivalence.) The case for the choice of *ultramodal* noneism – i.e. of a noneism with a logical theory which provides (in the way that relevant logic does) logical replacement conditions tighter than a modal theory does – is substantial (in my view, overwhelming; for a main part of the case see UL and RLR; but see also 11.2 [reprinted in Vol. 3 *—Eds.*]). But the ultramodal choice leaves open the question whether the theory should include classical (and modal) logics as a part (i.e., in effect, should be an extension of consistent noneism) or not.

Radical noneism combines ultramodal and paraconsistent positions, with ultramodal noneism assumed to include relevant noneism; its logic is an ultralogic (i.e. some variant of the ultramodal logic of UL). The position toyed with in several places in later chapters

is radical noneism. But whether this very promising-looking position can be sustained is not yet completely clear; as remarked, it calls for much more investigation. That is one of the reasons why it is important to keep options a little open, and to carry consistent noneism along in the theories produced.

BIBLIOGRAPHY

Works referred to in the text

ABE Anderson, A. R. and N. D. Belnap, Jr., *Entailment*, vol. 1, Princeton University Press, Princeton, N. J., 1975.

BP Routley, R. and V., *Beyond the Possible*, in preparation.

DCL Routley, R. and Meyer, R. K., "Dialectical logic, classical logic, and the consistency of the world", *Studies in Soviet Thought* **16** (1976) 1–25.

DLSM Routley, R., "Dialectical logic, semantics and metamathematics", *Erkenntnis* **14** (1979) 301–331.

DS Routley, R., "Domainless semantics for free, quantification and significance logics", *Logique et analyse* **14** (1971) 603–626.

EI Routley, R., "Existence and identity in quantified modal logics", *Notre Dame Journal of Formal Logic* **10** (1969) 113–149.

ENP1 Routley, R. and V., "Human chauvinism and environmental ethics", in *Environmental Philosophy*, edited by D. Mannison, M. McRobbie and R. Routley, Canberra, Research School of Social Sciences, Australian National University, 1980, 96–189.

ENP2 Routley, V. and R., "Social theories, self management, and environmental problems", in *Environmental Philosophy*, edited by D. Mannison, M. McRobbie and R. Routley, Canberra, Research School of Social Sciences, Australian National University, 1980, 217–332.

EP Meinong, A., *On Emotional Presentation*, trans. M. L. Schubert-Kelsi, Northwestern University Press, 1972.

ER Meyer, R. K. and Routley, R., "Extensional reduction I", *Monist* **60** (1977) 355–369.

Erfgl. Meinong, A., *Über die Erfuhrungsgrundlagen ausseres Wissens*, Springer, Berlin, 1906.

FLP Quine, W. V., *From a Logical Point of View*, Second edition, revised, Harvard University Press, 1961.

GA Meinong, A., *Gesamtausgabe*, edited by R. M. Chisholm, R. Haller and R. Kindinger, Akademische Druck- und Verlagsanstalt, Graz, 1969–1973.

GB Geach, P. and Black, M., eds., *Translations from the Philosophical Writings of Gottlob Frege*, Blackwell, Oxford, 1952.

ILT Strawson, P. F., *Introduction to Logical Theory*, Methuen, London, 1952.

LSL Carnap, R., *The Logical Syntax of Language*, Routledge and Kegan Paul, London, 1949.

ML Quine, W. V., *Mathematical Logic*, Revised, Harvard University Press, Cambridge, Mass., 1951.

MN Carnap, R., *Meaning and Necessity*, Enlarged, University of Chicago Press, Chicago, 1956.

MNG Grossmann, R., *Meinong*, Routledge and Kegan Paul, London, 1974.

Mög Meinong, A., *Über Möglichkeit und Wahrscheinlichkeit*, Leipzig, 1915.

MP Russell, B., *Introduction to Mathematical Philosophy*, Allen and Unwin, London, 1919. Chapter 16 is reprinted in R. Ammerman, ed., *Classics of Analytic Philosophy*, New York, 1965. Page references are to the reprint.

MTD Routley, R., "Meaning as semantical superstructure: a universal theory of meaning, truth and denotation?", *Philosophica* **19** (1977) 33–68.

NE Routley, R., "Non-existence does not exist", *Notre Dame Journal of Formal Logic* **11** (1970) 289–320.

NNL Sylvan, R., "Nihilisms and nihilist logics", *Discussion Papers in Environmental Philosophy* **4** (1983).

OD Russell, B., "On denoting", *Mind* **14** (1905) 479–493. Reprinted in Marsh 1956, pp. 41–56. All page references are to the reprint.

OED *Oxford English Dictionary*, Clarendon Press, Oxford, 1971.

OP Hawkins, D. and Pauling, L., eds., *Orthomolecular Psychiatry: Treatment of Schizophrenia*, W. H. Freeman, San Francisco, 1973.

OR Strawson, P. F., "On referring", *Mind* **59** (1950) 320–344.

OT Russell, B., "On order in time", *Proceedings, Cambridge Philosophical Society* **32** (1936) 216–228. Reprinted in Marsh 1956, pp. 347–363.

P Russell, B., *The Principles of Mathematics*, Second, Allen and Unwin, London, 1948.

PB Putnam, H. and Benacerraf, P., eds., *Philosophy of Mathematics*, Prentice-Hall, Englewood Cliffs, N. J., 1964.

PC *Pears Cyclopedia*, 80th, Pelham Books, U. K., 1971.

PLA Russell, B., "The philosophy of logical atomism", *Monist* **28** (1918) 495–527 and **29** (1919) 33–63, 190–222 and 344–380. Reprinted in Marsh 1956, pp. 177–281. Page references are to the reprint.

PLO Morscher, E., Czermak, J. and Weingartner, P., eds., *Problems in Logic and Ontology*, Akademische Druck- und Verlagsanstalt, Graz, 1977.

PM Whitehead, A. N. and Russell, B., *Principia Mathematica*, Second edition, Cambridge University Press, Cambridge, 1950. (Editions 1 and 2 are distinguished where necessary as PM1 and PM2).

PT O'Donnell, R., Stevens, P. and Lennie, I., eds., *Paper Tigers: an Introduction to the Critique of Social Theory*, Pilot, Department of General Philosophy, University of Sydney, 1978.

RLR Routley, R., Meyer, R. K., Plumwood, V. and Brady, R., *Relevant Logics and Their Rivals*, RSSS, Australian National University, Canberra, 1980.

SE Routley, R., "Some things do not exist", *Notre Dame Journal of Formal Logic* **7** (1966) 251–276.

Slog Goddard, L. and Routley, R., *The Logic of Significance and Context*, Scottish Academic Press, Edinburgh, 1973.

SMM Routley, R., "The semantical metamorphosis of metaphysics", *Australasian Journal of Philosophy* **54** (1976) 187–205.

ST Routley, R., "On a significance theory", *Australasian Journal of Philosophy* **44** (1966) 172–209.

Stell Meinong, A., *Über die Stellung der Gegenstandstheorie im System der Wissenschaften*, R. Voitlander Verlag, Leipzig, 1907.

TO Meinong, A., "The theory of objects", in *Realism and the Background of Phenomenology*, edited by R. M. Chisholm, Glencoe, Ill., Free Press, 1960, 76–117. Translation of "Über Gegenstandstheorie" in *Untersuchungen zur Gegenstandstheorie und Psychologie*, Barth, Leipzig, 1904.

UA Meinong, A., *Über Annahmen*, Second, Barth, Leipzig, 1910.

UL Routley, R., "Ultralogic as universal?", *Relevance Logic Newsletter* **2** (1977), 50–90 and 138–175. Also included as an appendix in this volume [reprinted in Vol. 4 *—Eds.*].

US Routley, R., "Universal semantics?", *Journal of Philosophical Logic* **4** (1975) 327–356.

WN Routley, R., "What numbers are", *Logique et analyse* **8** (1965) 196–208.

WO Quine, W. V., *Word and Object*, MIT Press, Cambridge, Mass., 1960.

Ackermann, R. J., *Belief and Knowledge*, Macmillan, London, 1972.

Ajdukiewicz, K., "Die syntaktische Konnexität", *Studia Philosophica* **2** (1935) 1–27. Translated as "Syntactic connexion" in S. McCall, ed., *Polish Logic*, Oxford, 1967, pp. 207–231. Page references are to the translation.

Anderson, J., *Studies in Empirical Philosophy*, Angus and Robertson, Sydney, 1962.

Andrews, P., *A Transfinite Type Theory with Type Variables*, North-Holland, Amsterdam, 1965.

Anscombe, G. E. M., *An Introduction to Wittgenstein's Tractatus*, Hutchinson, London, 1958.

Anson's, *Law of Contract*, edited by A. G. Guest, 24th, Clarendon, Oxford, 1975.

Armstrong, D. M., *Perception and the Physical World*, Routledge and Kegan Paul, London, 1961.

Armstrong, D. M., *A Materialist Theory of the Mind*, Routledge and Kegan Paul, London, 1968.

Armstrong, D. M., *Belief, Truth and Knowledge*, Cambridge University Press, Cambridge, 1973.

Armstrong, D. M., "Naturalism, materialism, and first philosophy", in *Ist Systematische Philosophie Möglich?*, (Stuttgarter Hegel-Kongress 1975), edited by D. Henrich, Bonn, Grundmann, 1977, 411–425.

Armstrong, D. M., *Nominalism and Realism: Universals and Scientific Realism, volume I*, Cambridge University Press, Cambridge, 1978.

Armstrong, D. M., *A Theory of Universals: Universals and Scientific Realism, volume II*, Cambridge University Press, Cambridge, 1978.

Arruda, A. I., "A survey of paraconsistent logic", in *Proceedings of the Fourth Latin-American Logic Conference*, Amsterdam, North-Holland, 1979.

Asser, G., "Theorie der logischer Auswahlfunktionen", *Zeitschrift für mathematische Logik und Grundlagen der Mathematik* **3** (1957) 30–68.

Austin, J. L., *Sense and Sensibilia*, Clarendon Press, Oxford, 1962.

Ayer, A. J., *Language, Truth and Logic*, Gollancz, London, 1946.

Ayer, A. J., *The Problem of Knowledge*, Macmillan, London, 1956.

Baldwin, J. M., ed., *Dictionary of Philosophy and Psychology*, Macmillan, New York, 1901–1905.

Barber, K. F., *Meinong's Hume Studies: Translation and Commentary*, University Microfilms, Ann Arbor, 1966. Ph.D., University of Iowa, 1966.

Barcan, R. C., "A functional calculus of first order based on strict implication", *Journal of Symbolic Logic* **11** (1946) 1–16.

Barcan-Marcus, R., "Extensionality", *Mind* **69** (1960) 55–62.

Barker, J. and Grigg, G., *A Field Guide to Australian Frogs*, Rigby, Melbourne, 1977.

Bentham, J., see C. K. Ogden, *Bentham's Theory of Fictions*, Kegan Paul, Trench, Trubner, London, 1932.

Bergmann, G., *Meaning and Existence*, University of Wisconsin Press, Madison, 1959.

Bergmann, G., *Logic and Reality*, University of Wisconsin Press, Madison, 1964.

Bergmann, G., *Realism. A critique of Brentano and Meinong*, University of Wisconsin Press, Madison, 1967.

Berkeley, G., "The Principles of Human Knowledge", in *The Works of George Berkeley, Bishop of Cloyne*, edited by A. A. Luce and T. E. Jessop, vol. 2, London, Thomas Nelson, 1949.

Bernays, P., "On platonism in mathematics", in PB, 274–286.

Black, M., *Language and Philosophy*, Cornell University Press, Ithaca, 1949.

Blackburn, S., ed., *Meaning, Reference and Necessity: New Studies in Semantics*, Cambridge University Press, Cambridge, 1975.

Blake, W., *A Descriptive catalogue*, 1809.

Blanshard, B., *The Nature of Thought*, Allen and Unwin, London, 1939.

Blocker, H. G., "The truth about fictional entities", *Philosophical Quarterly* **24** (1974) 27–36.

Bradford, D. E., "A bibliography on the topic of existence", *Philosophy Research Archives* **2**.1137 (1976) 20–58.

Bradley, F. H., *Appearance and Reality*, Clarendon Press, Oxford, 1930.

Brady, R. T. and Routley, R., "Don't care was made to care", *Australasian Journal of Philosophy* **51** (1973) 211–225.

Bressan, A., "On the semantics for the language ML", and discussion, in PLO.

Bressan, A., "Metodo di assiomatizzazione in senso stretto della meccanica classica. Applicazione di esso ad alcuni problemi di assiomatizzazione non ancora completamente risolti", *Rendiconti di Seminario matematico, Università di Padova* **32** (1962) 55–212.

Bressan, A., *A General Interpreted Modal Calculus*, Yale University Press, New Haven, 1972.

Bressan, A., *Relativistic Theories of Materials*, Springer, Berlin, 1978.

Broad, C. D., *Religion, Philosophy and Psychical Research*, Routledge and Kegan Paul, London, 1953.

Brouwer, L. E. J., *Collected Works*, North-Holland, Amsterdam, 1975–76.

Bunge, M., *Treatise on Basic Philosophy,* Volume 3*, Ontology I. The Furniture of the World*, Reidel, Dordrecht, 1977.

Bunting, I. A., "Perception and the existence criterion", *Philosophical Studies (Ireland)* **20** (1972) 77–89.

Cahn, S., "Fatalistic arguments", *Journal of Philosophy* **61** (1964) 295–304.

Capra, F., *The Tao of Physics*, Wildwood House, London, 1975.

Cartwright, R. L., "Negative existentials", in *Philosophy and Ordinary Language*, edited by C. E. Caton, Urbana, University of Illinois Press, 1963, 55–66.

Castañeda, H. N., "Thinking and the structure of the world", *Philosophia* **4** (1974) 3–40.

Castañeda, H. N., "Identity and sameness", *Philosophia* **5** (1975) 121–150.

Castañeda, H. N., "Rejoinder to Professor Michael Loux", *Critica* **8** (1976) 109–116.

Castañeda, H. N., "Fiction and reality: their relations and connections", *Poetics* **8** (1979) 31–62.

Caton, C., "Overview", in *Semantics*, edited by D. D. Steinberg and L. A. Jakobovits, Cambridge, Cambridge University Press, 1971.

Chalmers, A., *What Is This Thing Called Science?*, University of Queensland Press, St Lucia, 1976.

Chalmers, A. and Suchting, W., "Empiricism", in PT, 29–49.

Chihara, C. S., "Truth, meaning and paradox", *Nous* **10** (1976) 305–311.

Chisholm, R. M., "Problems of identity", in Munitz 1971, 3–30.

Chisholm, R. M., *Realism and the Background of Phenomenology*, Free Press, Glencoe, Ill., 1960.

Chisholm, R. M., "Meinong, Alexius", in *The Encyclopedia of Philosophy*, edited by P. Edwards, vol. 5, London, Macmillan, 1967, 261–263.

Chisholm, R. M., "Review of Kindinger 1965", *Philosophical Review* **77** (1968) 372–375.

Chisholm, R. M., "Beyond being and nonbeing", *Philosophical Studies* **24** (1972) 245–257. Also in Haller 1972.

Chisholm, R. M., "Homeless objects", *Revue Internationale de Philosophie* **27** (1973) 207–223.

Chisholm, R. M., *Person and Object*, Allen and Unwin, London, 1976.

Church, A., "A formulation of the simple theory of types", *Journal of Symbolic Logic* **5** (1940) 56–68.

Church, A., "On Carnap's analysis of statements of assertion and belief', *Analysis* **10** (1950) 97–99.

Church, A., *Introduction to Mathematical Logic*, Princeton University Press, Princeton, N. J., 1956.

Cresswell, M. J., *Logics and Languages*, Methuen, London, 1973.

Cresswell, M. J., "Critical study of Montague 1974", *Philosophia* **6** (1976) 193–207.

Crittenden, C., "Ontology and the theory of descriptions", *Philosophy and Phenomenological Research* **31** (1970–71) 85–96.

Crittenden, C., "Thinking about non-being", *Inquiry* **16** (1973) 290–312.

Curry, H. B., *Foundations of Mathematical Logic*, McGraw-Hill, New York, 1963.

Davidson, D., "Truth and meaning", *Synthese* **17** (1967) 304–323.

Davidson, D., "On saying that", *Synthese* **19** (1968–69) 130–146. Also in *Words and Objections*, edited by D. Davidson and J. Hintikka, Reidel, Dordrecht, 1969, pp. 158–174.

Davidson, D., "Thought and talk", in *Mind and Language*, edited by S. Guttenplan, Oxford, Clarendon Press, 1975, 7–23.

Davis, J. W., Hockney, D. J. and Wilson, W. K., eds., *Philosophical Logic*, Reidel, Dordrecht, 1969.

Dedekind, R., *Was Sind und Was Sollen die Zahlen?*, Sixth edition, Vieweg, Braunschweig, 1930.

Devine, P. E., "The logic of fiction", *Philosophical Studies* **26** (1974) 389–399.

Donnell, F. H., "A note about presupposition", *Mind* **81** (1972) 124–125.

Donnellan, K., "Proper names and identifying descriptions", in *Semantics of Natural Language*, edited by D. Davidson and G. Harman, Dordrecht, Reidel, 1972. Originally published in *Synthese* **20** (1970).

Donnellan, K., "Speaking of nothing", *Philosophical Review* **83** (1974) 3–31.

Dretske, F. I., *Seeing and Knowing*, Routledge and Kegan Paul, London, 1969.

Dummett, M., *Frege: Philosophy of Language*, Duckworth, London, 1973.

Dyche, R. E., "Meinong's Theory of Objects: a Reinterpretation and Defense", PhD thesis, Rutgers University, The State University of New Jersey, New Brunswick, 1976.

Edwards, P., "Bertrand Russell's doubts about induction", in *Logic and Language*, edited by A. Flew, First series, Oxford, Blackwell, 1960, 55–79.

Feyerabend, P., *Against Method*, New Left Books, London, 1975.

Feys, R., *Modal Logics*, edited by J. Dopp, Nauwelaerts, Louvain, 1965.

Findlay, J. N., "Use, usage and meaning", *Aristotelian Society Supplementary Volume* **35** (1961) 231–242.

Findlay, J. N., *Meinong's Theory of Objects and Values*, Second, Clarendon Press, Oxford, 1963.

Findlay, J. N., "Meinong the phenomenologist", *Revue Internationale de Philosophie* **57** (1973) 161–177.

Flew, A., *Introduction to Western Philosophy*, Thames and Hudson, London, 1971.

Forster, E. M., *Aspects of the Novel*, E. Arnold, London, 1949.

van Fraassen, B., "Singular terms, truth-value gaps, and free logic", *Journal of Philosophy* **63** (1966) 481–495.

van Fraassen, B., *An Introduction to the Philosophy of Time and Space*, Random House, New York, 1970.

van Fraassen, B., *Formal Semantics and Logic*, Macmillan, New York, 1971.

Fraenkel, A. A., Bar-Hillel, Y. and Levy, A., *Foundations of Set Theory*, North-Holland, Amsterdam, 1973.

Freeman, K., *Ancilla to the Pre-Socratic Philosophers*, Blackwell, Oxford, 1947.

Frege, G., "Über Sinn und Bedeutung", in *Zeitschrift für Philosophie und philosophische Kritik*, 1892. Translated as "On sense and reference" in GB.

Frege, G., *The Foundations of Arithmetic*, translated by J. L. Austin, Blackwell, Oxford, 1950.

Gale, R. M., ed., *The Philosophy of Time*, Doubleday, New York, 1967.

Geach, P. T., *Reference and Generality*, Cornell University Press, Ithaca, 1962.

Geach, P. T., *Logic Matters*, Blackwell, Oxford, 1972.

Goddard, L. and Routley, R., "Use, mention and quotation", *Australasian Journal of Philosophy* **44** (1966) 1–49.

Gödel, K., "Über formal unentscheidbare Sätze des Principia Mathematica und verwandter Systeme I", *Monatshefte für Mathematik and Physik* **38** (1931) 173–198.

Godfrey-Smith, W., "Time and Existence", Doctoral Dissertation, King's College, Cambridge, 1976.

Godfrey-Smith, W., "Beginning to exist and ceasing to exist", *Philosophical Studies* **32** (1977) 393–402.

Godfrey-Smith, W., "The generality of predictions", *American Philosophical Quarterly* **15** (1978) 15–25.

Goodman, N., "A world of individuals", in *The Problem of Universals*, Notre Dame University Press, 1956. Reprinted in N. Goodman, *Problems and Projects*, Bobbs-Merrill, Indianapolis, 1972.

Goodman, N., *The Structure of Appearance*, Third edition, Reidel, Dordrecht, 1977.

Goodman, N. and Leonard, H. S., "The calculus of individuals and its uses", *Journal of Symbolic Logic* **5** (1940) 45–55.

Goodman, P., *Community of Scholars and Compulsory Miseducation*, Random House, New York, 1966.

Gram, M. S., "Ontology and the theory of descriptions", in Klemke 1970, 118–143.

Grave, S. A., *The Scottish Philosophy of Common Sense*, Clarendon Press, Oxford, 1960.

Grave, S. A., "Common Sense", in *Encyclopedia of Philosophy*, edited by P. Edwards, vol. 2, New York, Macmillan, 1967, 155–160.

Gregory, R. L., *Eye and Brain: the Psychology of Seeing*, Weidenfeld and Nicolson, London, 1966.

Grene, M., *Introduction to Existentialism*, University of Chicago Press, Chicago, 1962.

Grice, H. P., "Utterer's meaning, sentence meaning, and word meaning", *Foundations of Language* **4** (1968) 225–242.

Griffin, N., *Relative Identity*, Oxford University Press, London, 1977.

Griffin, N., "Russell's 'horrible travesty' of Meinong", *Russell: the Journal of the Bertrand Russell Archives* **25–28** (1978).

Griffin, N., "The independence of Sosein from Sein", *Grazer Philosophische Studien* **9** (1979).

Griffin, N. and Harton, M., "Sceptical Arguments", *Philosophical Quarterly* **31** (1981) 17–30.

Grossmann, R., "Meinong's doctrine of the *Aussersein* of the pure object", *Noûs* **8** (1974) 67–82.

Grünbaum, A., *Philosophical Problems of Space and Time*, A. A. Knopf, New York, 1963.

Haack, S., *Deviant Logic: Some Philosophical Issues*, Cambridge University Press, London, 1974.

Hailperin, T., "Quantification theory and empty individual-domains", *Journal of Symbolic Logic* **18** (1953) 197–200.

Haller, R., ed., *Jenseits von Sein and Nichtsein*, Akademische Druck- und Verlagsanstalt, Graz, 1972.

Hansson, B. and Gärdenfors, P., "A guide to intensional semantics", in *Modality, Morality and Other Problems of Sense and Nonsense*, Lund, Gleerup, 1973, 151–167.

Harré, R., *The Philosophies of Science*, Oxford University Press, London, 1972.

Hempel, C. G., "Problems and changes in the empiricist criterion of meaning", *Revue Internationale de Philosophie* **4** (1950) 41–63.

Hempel, C. G., *Philosophy of Natural Science*, Prentice-Hall, Englewood Cliffs, New Jersey, 1966.

Henkin, L., "The completeness of the first-order functional calculus", *Journal of Symbolic Logic* **14** (1949) 159–166.

Henkin, L., "Completeness in the theory of types", *Journal of Symbolic Logic* **15** (1950) 81–91. Reprinted in *The Philosophy of Mathematics*, edited by J. Hintikka, Oxford University Press, London, pp. 51–63.

Hilbert, D. and Bernays, P., *Grundlagen der Mathematik*, Springer, Berlin, 1934–39.

Hinckfuss, I., "Necessary existential dependence", *Australasian Journal of Philosophy* **54** (1976) 123–132.

Hintikka, J., "Towards a theory of definite descriptions", *Analysis* **19** (1958–59) 79–85.

Hintikka, J., "Existential presuppositions and existential commitments", *Journal of Philosophy* **56** (1959) 125–137.

Hinton, J. M., "Quantification, Meinongianism, and the ontological argument", *Philosophical Quarterly* **22** (1972) 97–109.

Hirst, R. J., "Realism", in *Encyclopedia of Philosophy*, edited by P. Edwards, vol. 7, New York, Macmillan, 1967, 77–83.

Hobbes, T., *Leviathan*, Clarendon Press, Oxford, 1909.

Hollis, M. and Nell, E. J., *Rational Economic Man*, Cambridge University Press, London, 1975.

Honoré, A. M., "Reference to the non-existent", *Philosophy* **46** (1971) 302–308.

Hospers, J., *An Introduction to Philosophical Analysis*, Routledge and Kegan Paul, London, 1956.

Howell, R., "Fictional objects: how they are and how they aren't", *Poetics* **8** (1979) 129–177.

Hull, D. L. and Snyder, D. P., "Contemporary logic and evolutionary taxonomy: a reply to Gregg", *Systematic Zoology* **18** (1969) 347–354.

Hume, D., *A Treatise of Human Nature* and *On the Academical or Sceptical Philosophy*, in *Hume's Philosophical Works*, edited by T. H. Green and T. H. Grose, 4 volumes, London, 1874–75.

Huxley, A., *The Doors of Perception and Heaven and Hell*, Penguin, 1959.

Jeffrey, R., *The Logic of Decision*, McGraw-Hill, New York, 1965.

Johnson, W. E., *Logic*, Cambridge University Press, Cambridge, 1921–1924.

Kalish, D. and Montague, R., *Logic: Techniques of Formal Reasoning*, Harcourt, Brace and World, New York, 1964.

Kant, I., *Critique of Pure Reason*, Unabridged edition, translated by N. Kemp Smith, Macmillan, London, 1929. Abridged edition, Macmillan, London, 1934.

Kaplan, B., *The Inner World of Mental Illness*, Harper and Row, New York, 1964.

Kaplan, D., "Quantifying in", *Synthese* **19** (1968–69) 178–214. Reprinted in *Words and Objections*, edited by D. Davidson and J. Hintikka, Reidel, Dordrecht, 1969, pp. 206–242.

Kemeny, J. G., "Models of logical systems", *Journal of Symbolic Logic* **13** (1948) 16–30.

Kemeny, J. G., "A new approach to semantics – parts I and II", *Journal of Symbolic Logic* **21** (1956) 1–27, 149–161.

Kenny, A., *Descartes*, Random House, New York, 1968.

Kimball, J. P., "Predicates definable over transformational derivations by intersection with regular languages", *Information and Control* **11** (1967) 177–195.

Kimball, J. P., *The Formal Theory of Grammar*, Prentice-Hall, Englewood Cliffs, N. J., 1973.

Kindinger, R., ed., *Philosophenbriefe aus der Wiesenschaftlichen Korrespondenz von Alexius Meinong*, Akademische Druck- und Verlagsanstslt, Graz, 1965.

Kiteley, M., "Is existence a predicate?", *Mind* **73** (1964) 364–373.

Kleene, S. C., *Introduction to Metamathematics*, North-Holland, Amsterdam, 1952.

Klemke, E. D., ed., *Essays on Bertrand Russell*, University of Illinois Press, Urbana, 1970.

Kneale, W., "Is Existence a Predicate?", *J. Symbolic Logic* **2** (1937) 60–61.

Kneale, W., *Probability and Induction*, Clarendon Press, Oxford, 1949.

Kneale, W. and M., *The Development of Logic*, Clarendon Press, Oxford, 1962.

Kneebone, G. T., *Mathematical Logic and the Foundations of Mathematics*, Van Nostrand, Princeton, 1963.

Koestler, A. and Smythies, J. R., eds., *Beyond Reductionism: New Perspectives in the Life Sciences*, Hutchinson, London, 1969.

Kripke, S., "Semantical considerations on modal logic", *Acta Philosophica Fennica* **16** (1963) 83–94. (Proceedings of a Colloquium on Modal and Many-Valued Logics).

Kripke, S., "Identity and necessity", in Munitz 1971, 1971, 135–164.

Kripke, S., "Naming and necessity", in *Semantics of Natural Languages*, edited by D. Davidson and G. Harman, Dordrecht, Reidel, 1972.

Kripke, S., *Empty Reference*, Shearman Lectures, University of London, 1973. Notes taken by I. Hacking, J. Heale and T. Baldwin.

Kuhn, T. S., *The Structure of Scientific Revolutions*, Second enlarged edition, University of Chicago Press, Chicago, 1970.

Lakatos, I., "Proofs and refutations", *British Journal for the Philosophy of Science* **14** (1963–64), 1–25, 120–139, 221–245 and 297–342. Reprinted as *Proofs and Refutations, the Logic of Mathematical Discovery*, Cambridge University Press, London, 1966.

Lakatos, I., "A renaissance of empiricism in the recent philosophy of mathematics", in *Mathematics, Science and Epistemology, Philosophical Papers of Imré Lakatos*, edited by J. Worrell and G. Curry, vol. 2, Cambridge, Cambridge University Press, 1978.

Lambert, K., "Existential Import Revisited", *Notre Dame Journal of Formal Logic* **4** (1963) 288–292.

Lambert, K., "Being and being so", in Haller 1972, 1972, 37–46.

Lambert, K., "The theory of objects: a review discussion of J. N. Findlay's *Meinong's Theory of Objects and Values*", *Inquiry* **16** (1973) 221–224.

Lambert, K., "Impossible objects", *Inquiry* **17** (1974) 303–314.

Lambert, K., "On 'The durability of impossible objects'", *Inquiry* **19** (1976) 251–253.

Lambert, K. and van Fraassen, B., "On Free Description Theory", *Zeitschrift fur Mathem. Logik und Grundlagen der Mathematik* **13** (1967) 225–240.

Lambert, K. and van Fraassen, B., *Derivation and Counterexample: an Introduction to Philosophical Logic*, Dickenson, Encino, Calif., 1972.

Leblanc, H., *Truth-Value Semantics*, North-Holland, Amsterdam, 1976.

Leblanc, H. and Hailperin, T., "Non-designating singular terms", *Philosophical Review* **68** (1959) 239–243.

Leblanc, H. and Thomason, R., "Completeness theorems for some presupposition-free logics", *Fundamenta Mathematica* **62** (1968) 123–164.

Lejewski, C., "Logic and existence", *British Journal for the Philosophy of Science* **5** (1954–55) 104–119.

Lenoci, M., "Bibliografia degli studi su Alexius Meinong", *Rivista di Filosofia Neo-scolastica* **62** (1970) 437–473.

Leonard, H., "The logic of existence", *Philosophical Studies* **7** (1956) 49–64.

Lewis, C. I., "Facts, systems, and the unity of the world", *Journal of Philosophy* **20** (1923) 141–151.

Lewis, D., "General semantics", *Synthese* **22** (1970–71) 18–67. Reprinted in *Semantics of Natural Language*, edited by D. Davidson and G. Harman, Reidel, Dordrecht, 1972, pp. 169–218.

Lewis, D., *Counterfactuals*, Blackwell, Oxford, 1973.

Lewy, C., *Meaning and Modality*, Cambridge University Press, Cambridge, 1976.

Linsky, L., *Referring*, Routledge and Kegan Paul, London, 1967.

Linsky, L., ed., *Reference and Modality*, Oxford University Press, London, 1971.

Linsky, L., *Names and Descriptions*, University of Chicago Press, Chicago, 1977.

Locke, J., *An Essay Concerning Human Understanding*, edited by P. Nidditch, Clarendon Press, Oxford, 1975.

Loparić, A., "Une étude sémantique de quelques calculs propositionnels", *Comptes Rendus de l'Academie des Sciences de Paris* **284 A** (1977) 835–838.

Lukes, S., *Individualism*, Blackwell, Oxford, 1973.

Lycan, W., "The trouble with possible worlds", in *The Possible and the Actual*, edited by M. Loux, Ithaca, Cornell University Press, 1979, 274–316.

Malcolm, N., "Anselm's ontological arguments", *Philosophical Review* **69** (1960) 41–62.

Marcuse, H., *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society*, Routledge and Kegan Paul, London, 1964.

Margolis, J., *Knowledge and Existence: an Introduction to Philosophical Problems*, Oxford University Press, New York, 1973.

Marsh, R., ed., *Logic and Knowledge*, Allen and Unwin, London, 1956.

Martin, B., *The Bias of Science*, Society for Social Responsibility in Science, Canberra, 1979.

Martin, R. M., "A homogenous system for formal logic", *Journal of Symbolic Logic* **3** (1943) 1–23.

Matilal, B. K., *Epistemology, Logic and Grammar in Indian Philosophical Analysis*, Mouton, Paris, 1971.

McKinsey, J. C. C., "A solution of the decision problem for the Lewis systems S2 and S4, with an application to topology", *Journal of Symbolic Logic* **6** (1941) 117–134.

Meinong, A., ed., *Untersuchungen zur Gegenstandstheorie und Psychologie*, Barth, Leipzig, 1904.

Mendelson, E., *Introduction to Mathematical Logic*, Van Nostrand, Princeton, 1964.

Miliband, R., *The State in Capitalist Society*, Quartet Books, London, 1973.

Mill, J. S., *A System of Logic*, Longmans, Green, London, 1947.

Mish'alani, J., "Thought and object", *Philosophical Review* **71** (1962) 185–201.

Monro, D. H., "Bentham, Jeremy", in *The Encyclopedia of Philosophy*, edited by P. Edwards, vol. 1, New York, Macmillan, 1967, 280–285.

Montague, R., "Universal Grammar", *Theoria* **36** (1970a) 373–98.

Montague, R., "English as a formal language", in *Linguaggi nella società e nella tecnica*, edited by Bruno et al., Milan, Edizioni di Comunità, 1970b, 189–224.

Montague, R., *Formal Philosophy*, edited by R. H. Thomason, Yale University Press, New Haven, 1974.

Moore, G. E., "Is existence a predicate?", in *his* Philosophical Papers.

Moore, G. E., *Principia Ethica*, Cambridge University Press, Cambridge, 1903.

Moore, G. E., *Some Main Problems of Philosophy*, Allen and Unwin, London, 1953.

Moore, G. E., *Philosophical Papers*, Allen and Unwin, London, 1959.

Mortensen, C., "A theorem on verisimilitude", *Bulletin of the Section of Logic, Polish Academy of Sciences* **7** (1978) 34–43.

Munitz, M. K., *The Mystery of Existence*, Appleton-Century-Crofts, New York, 1965.

Munitz, M. K., ed., *Identity and Individuation*, New York University Press, New York, 1971.

Munitz, M. K., *Existence and Logic*, New York University Press, New York, 1974.

Naess, A., "An Empirical Study of the Expressions 'true', 'perfectly certain', and 'extremely probable'", *Avhandlinger utgitt av Det Norske Videnskaps-Akademi i Oslo. II. Hist.-Filos. Klasse* 4 (1953).

Nagel, E., *The Structure of Science*, Routledge and Kegan Paul, London, 1961.

Nakhnikian, G. and Salmon, W., "'Exists' as a predicate", *Philosophical Review* **66** (1957) 535–542.

Nerlich, G. C., "Presupposition and entailment", *American Philosophical Quarterly* **2** (1965) 33–42.

Niven, B. S., "The formal definition of the environment of an animal", *Australian Journal of Zoology* **5** (1980).

Noll, W., "Foundations of continuum mechanics and thermodynamics", *Ardi Bol. Mech. Anal.* **52**.62 (1973).

Ogden, C. K., *Bentham's Theory of Fictions*, Kegan Paul, Trench, Trubner, London, 1932.

Pap, A., *Semantics and Necessary Truth*, Yale University Press, New Haven, 1958.

Pap, A., *An Introduction to the Philosophy of Science*, Free Press, New York, 1962.

Parsons, T., "A prolegomenon to Meinongian semantics", *Journal of Philosophy* **71** (1974) 561–580.

Parsons, T., "A Meinongian analysis of fictional objects", *Grazer Philosophische Studien* **1** (1975) 73–86.

Parsons, T., "Nuclear and extranuclear properties, Meinong, and Leibniz", *Nous* **12** (1978) 137–151.

Parsons, T., *Nonexistent Objects*, typescript 1978, Yale University Press, forthcoming.

Passmore, J. A., *A Hundred Years of Philosophy*, Duckworth, London, 1957.

Passmore, J. A., *Philosophical Reasoning*, Second, Duckworth, London, 1970.

Peacocke, C. A. B., "Proper names, reference and rigid designation", in Blackburn 1975, 1975, 109–132.

Peters Jr., P. S. and Ritchie, R. W., "On the generative power of transformational grammars", *Information Sciences* **6** (1973) 49–83.

Plutarch, "Adversus Colotem", in *volume 14 of* Plutarch's Moralia, London, Heinemann, 1967, 190–315.

Pollock, J. L., "On logicism", in Klemke 1970, 388–395.

Popper, K., *The Logic of Scientific Discovery*, Hutchinson, London, 1959.

Popper, K., *Conjectures and Refutations*, Routledge and Kegan Paul, London, 1969.

Popper, K., *Objective Knowledge*, Oxford University Press, Oxford, 1972.

Priest, G., *The truth about mathematical objects*, typescript, 1978.

Priest, G., *The logical paradoxes: a unified account*, typescript, 1978a.

Priest, G., "The logic of paradoxes", *Journal of Philosophical Logic* **8** (1979) 219–241.

Priest, G., "Classical logic: a degenerate research programme in crisis", Paper presented at the 1979 Australasian Association of Philosophy Conference, Melbourne, 1979a.

Priest, G., Routley, R. and Norman, J., eds., *Paraconsistent Logic, Essays on the Inconsistent*, Philosophia Verlag, Munich, 1989.

Prior, A. N., *Time and Modality*, Clarendon Press, Oxford, 1957.

Prior, A. N., "A family of paradoxes", *Notre Dame Journal of Formal Logic* **2** (1961) 16–32.

Prior, A. N., *Formal Logic*, Second, Clarendon Press, Oxford, 1962.

Prior, A. N., "Is the concept of referential opacity really necessary?", *Acta Philosophica Fennica* **16** (1963), (Proceedings of a Colloquium on Modal and Many-Valued Logics).

Prior, A. N., *Past, Present and Future*, Clarendon Press, Oxford, 1967.

Putnam, H., "The thesis that mathematics is logic", in Schoenman 1967, 273–303.

Putnam, H., "Time and physical geometry", *Journal of Philosophy* **64** (1967) 240–247.

Quine, W. V., "On the individuation of attributes", in *The Logical Enterprise*, edited by A. R. Anderson, R. Marcus and R. M. Martin, New Haven, Yale University Press, 3–12.

Quine, W. V., "The problem of interpreting modal logic", *Journal of Symbolic Logic* **12** (1947) 43–48.

Quine, W. V., "Three grades of modal involvement", in *Proceedings of the XIth International Congress of Philosophy*, vol. 14, Brussels, 1953, 65–81.

Quine, W. V., *Methods of Logic*, Revised, Holt, Rinehart and Winston, New York, 1959.

Quine, W. V., *Philosophy of Logic*, Prentice-Hall, Englewood Cliffs, N. J., 1970.

Quine, W. V. and Goodman, N., "Steps toward a constructive nominalism", *Journal of Symbolic Logic* **12** (1947) 105–122.

Ramsey, P. F., *The Foundations of Mathematics and other Logical Essays*, Kegan Paul, London, 1931.

Rapaport, W. J., "Meinongian theories and a Russellian paradox", *Nous* **12** (1978) 153–180.

Rashdall, H., *The Theory of Good and Evil*, Second edition, Oxford University Press, Oxford, 1948.

Redmon, R. B., "Exists", *Mind* **82** (1973) 56–72.

Reichenbach, H., *The Philosophy of Space and Time*, Dover, New York, 1958.

Reid, T., *The works of Thomas Reid,* with notes and supplementary dissertations by Sir William Hamilton, Eighth edition, vol. I, J. Thin, Edinburgh, 1895.

Rennie, M. K., *Some Uses of Type Theory in the Analysis of Language*, Dept. of Philosophy, Research School of Social Sciences, Australian National University, 1974.

Rescher, N., "Truth and necessity in temporal perspective", in Gale 1967, 183–220.

Rescher, N., "On the logic of existence and denotation", *Philosophical Review* **68** (1959) 157–180.

Rescher, N., *Topics in Philosophical Logic*, Reidel, Dordrecht, 1968.

Rietdijk, C. W., "A rigorous proof of determinism derived from the special theory of relativity", *Philosophy of Science* **33** (1966) 341–344.

Robinson, A., *Non-Standard Analysis*, North-Holland, Amsterdam, 1970.

Rorty, A., "Realism and reference", *Monist* **59** (1976) 321–340.

Rosser, J. B., *Logic for Mathematicians*, McGraw-Hill, New York, 1946.

Roszak, T., *Where the Wasteland Ends: Politics and Transcendence in Post-Industrial Society*, Anchor, New York, 1973.

Routley, R., "What numbers are", *Logique et Analyse* **8** (1965) 196–208.

Routley, R., "A simple, natural deduction system", *Logique et Analyse* **12** (1969) 129–152.

Routley, R., "Existence and identity in quantified modal logic", *Notre Dame Journal of Formal Logic* **10** (1969a) 113–149, (cited as EI).

Routley, R., "Another 'fatal' objection to Meinongian objects", *Philosophical Studies* **25** (1974) 131–135.

Routley, R., "A rival account of logical consequence", *Reports on Mathematical Logic* **3** (1974a) 41–51.

Routley, R., "The durability of impossible objects: a reply to Lambert", *Inquiry* **19** (1976) 247–257.

Routley, R., "Problems and solutions in the semantics of quantified relevant logics I", in *Proceedings of the 4th Latin-American Symposium of Mathematical Logic*, edited by R. Chauquí et al., Amsterdam, Nort-Holland, 1979a, 305–340.

Routley, R., "Constant domain semantics for quantified non-normal modal logics and for certain quantified quasi-entailment logics", *Reports on Mathematical Logic* **10** (1979b) 103–121.

Routley, R., "The theory of objects as common-sense", *Grazer Philosophische Studien* **9** (1979c) 1–16.

Routley, R., Review of R. Grossmann's *Meinong*, (forthcoming).

Routley, R., "The choice of logical foundations: nonclassical choices and the ultralogical choice", *Studia Logica* **39**.1 (1980) 77–98.

Routley, R. and Loparić, A., "Semantical analyses of Arruda-da Costa P systems and adjacent non-replacement systems", *Studia Logica* **37** (1978) 301–320.

Routley, R. and Macrae, V., "On the identity of sensations and physiological occurrences", *American Philosophical Quarterly* **3** (1966) 87–110.

Routley, R. and Meyer, R. K., "Every sentential logic has a two-valued worlds semantics", *Logique et Analyse* **19** (1976) 174–194.

Routley, R., Meyer, R. K. and Goddard, L., "Choice and descriptions in enriched intensional languages – I", *Journal of Philosophical Logic* **3** (1974) 291–316. This paper, together with parts II and III and a Postscript also appears in PLO.

Routley^2 1972, Routley, R. and V., "The semantics of first degree entailment", *Nous* **6** (1972) 335–59.

Routley^2 1973, Routley, R. and V., "Rehabilitating Meinong's theory of objects", *Revue Internationale de Philosophie* **27** (1973) 224–254.

Routley^2 1975, Routley, R. and V., "The role of inconsistent and incomplete theories in the logic of belief", *Communication and Cognition* **8** (1975) 185–235.

Routley[2] 1975a, Routley, R. and V., "Ideal objects on a Meinongian theory of universals", in *Proceedings of the XVth World Congress of Philosophy*, (Varna, 17–22 September 1973), vol. 5, 1975, 581–589.

Russell, B., *A Critical Exposition of the Philosophy of Leibniz*, Cambridge University Press, 1900.

Russell, B., "Meinong's theory of complexes and assumptions", *Mind* **13** (1904) 204–219, 204–219.

Russell, B., "Review of Meinong, *Uhtersuchungen zur Gegenstandstheorie and Pyscholo-gie*", *Mind* **14** (1905) 530–538.

Russell, B., *The Problems of Philosophy*, Williams and Norgate, London, 1912.

Russell, B., *Introduction to Mathematical Philosophy*, Allen and Unwin, London, 1919, (cited as MP).

Russell, B., *The Principles of Mathematics*, Second edition, Allen and Unwin, London, 1937, (cited as P).

Russell, B., "Reply to Criticisms", in *The Philosophy of Bertrand Russell*, edited by P. A. Schilpp, La Salle, Ill., Open Court, 1944.

Russell, B., *A History of Western Philosophy*, Allen and Unwin, London, 1946.

Russell, B., *My Philosophical Development*, Allen and Unwin, London, 1959.

Ryle, G., "Review of Findlay, *Meinong's Theory of Objects*", *Oxford Magazine* **52** (1933–34) 118–120.

Ryle, G., *The Concept of Mind*, Hutchinson, London, 1949.

Ryle, G., *Dilemmas*, Cambridge University Press, Cambridge, 1954.

Ryle, G., *Collected Papers*, Hutchinson, London, 1971.

Ryle, G., "Intentionality-theory and the nature of thinking", in Haller 1972, 1972, 7–14. Also published in *Revue Internationale de Philosophie* **27** (1973) 255–264.

Scheffler, I., *The Anatomy of Inquiry*, Routledge and Kegan Paul, London, 1964.

Schilpp, P. A., ed., *The Philosophy of Bertrand Russell*, Library of Living Philosophers, Evanston, Ill., 1946.

Schilpp, P. A., ed., *The Philosophy of Rudolf Carnap*, Open Court, LaSalle, Ill., 1963.

Schoenman, R., ed., *Bertrand Russell, Philosopher of the century*, Allen and Unwin, 1967.

Scott, D., "Existence and description in formal logic", in Schoenman 1967, 1967.

Searle, J. R., "Proper names", *Mind* **67** (1958) 166–173.

Searle, J. R., *Speech Acts*, Cambridge University Press, Cambridge, 1969.

Shapere, D., ed., *Philosophical Problems of Natural Science*, Macmillan, New York, 1965.

Slade, C. J., "The myth of mistake in the English law of contract", *Law Quarterly Review* **70** (1954) 385–408.

Smart, J. J. C., *Philosophy and Scientific Realism*, Routledge and Kegan Paul, London, 1963.

Smart, J. J. C., "Science as an approximation to truth", in *Papers Presented to the Annual Conference of the Australasian Association for History and Philosophy of Science*, Melbourne, 1976.

Smart, J. J. C., "A critique of Meinongian semantics", Paper presented at the Australasian Association of Logic Conference, Melbourne, 1977. [Reprinted in volume 2 *—Eds.*].

Smart, J. J. C., "Is Occam's Razor a physical thing?", *Philosophy* **53** (1978) 382–385.

Smart, J. J. C., "The reality of the future", typescript, Canberra, 1979.

Smiley, T. J., "Sense without denotation", *Analysis* **20** (1959–60) 125–135.

Smullyan, A. F., "Modality and description", *Journal of Symbolic Logic* **13** (1948) 31–37.

Smythies, J. R., *Analysis of Perception*, Routledge and Kegan Paul, London, 1956.

Spengler, O., *The Decline of the West: Form and Actuality*, vol. 1, translated by C. F. Atkinson, Allen and Unwin, London, 1926.

Stein, H., "On Einstein-Minkowski space-time", *Journal of Philosophy* **65** (1968) 5–23.

Strawson, P. F., *Individuals*, Methuen, London, 1959.

Strawson, P. F., "Identifying reference and truth-values", *Theoria* **30** (1964).

Sturrock, J., *Paper Tigers: the Ideal Fictions of Jorge Luis Borges*, Clarendon Press, Oxford, 1977.

Tarski, A., "The semantical conception of truth and the foundations of semantics", *Philosophy and Phenomenological Research* **4** (1944) 341–376.

Tarski, A., *Logic, Semantics and Metamathematics*, translated by J. H. Woodger, Clarendon Press, Oxford, 1956.

Thom, R., "Role and limits of mathematization in applied sciences", Paper presented at the 6th International Congress of Logic, Methodology and Philosophy of Science, Hanover, Aug. 1979.

Thomason, R., "Indirect discourse is not quotational", *Monist* **60** (1977) 340–354.

Tichý, P., "An Approach to Intentional Analysis", *Nous* **5** (1971) 273–297.

Tooley, M., "Some objections to Meinongian semantics", seminar paper, Philosophy Department, Research School of Social Sciences, Australian National University, 1978.

Urmson, J. O., "Fiction", *American Philosophical Quarterly* **13** (1976) 153–157.

Vaihinger, H ., *The Philosophy of 'As If'*, translated by C. K. Ogden, Routledge and Kegan Paul, London, 1949.

Vendler, Z., "Each and every, any and all", *Mind* **71** (1962) 145–160. Reprinted in his *Linguistics in Philosophy*, Cornell University Press, Ithaca, 1967. Page references are to the reprint.

Vendler, Z., "A Note to the Paralogisms", in *Contemporary Aspects of Philosophy*, edited by G. Ryle, 1976, 111–121.

Vendler, Z., "Reference and introduction", Paper presented at the Australasian Association of Philosophy Conference, Canberra, 1978. Published in *Philosophia* **10** (1981) 253–273.

von Wright, G., *An Essay in Modal Logic*, North-Holland, Amsterdam, 1951.

von Wright, G., *Time, Change and Contradiction*, Cambridge University Press, Cambridge, 1969.

Waismann, F., "Language strata", in *Logic and Language, Second series*, edited by A. Flew, Oxford, Blackwell, 1953, 102–121.

Wang, H., "Truth definitions and consistency proofs", *Transactions of the American Mathematical Society* **73** (1952) 243–275.

Wang, H., *A Survey of Mathematical Logic*, Science Press, Peking and North-Holland, Amsterdam, 1963.

White, M., "The analytic and the synthetic: an untenable dualism", in *John Dewey: Philosophy of Science and Freedom*, edited by S. Hook, New York, Dial Press, 1950, 316–330.

Williams, B., "Comment on Kenny's Descartes' ontological argument", in *Fact and Existence*, edited by J. Margolis, Toronto, University of Toronto Press, 1969, 55–56.

Wisdom, J., *Interpretation and Analysis*, 1931.

Wisdom, J., *Other Minds*, Blackwell, Oxford, 1952.

Wisdom, J., *Philosophy and Psycho-Analysis*, Blackwell, Oxford, 1953.

Wittgenstein, L., *Tractatus Logico-Philosophicus*, Routledge and Kegan Paul, London, 1947.

Wittgenstein, L., *Philosophical Investigations*, Blackwell, Oxford, 1953.

Woods, J., *The Logic of Fiction*, Mouton, The Hague, 1974.

Woods, J., "Critical notice of S. Haack, *Deviant Logic*", *Canadian Journal of Philosophy* **7** (1977) 651–666.

Zemansky, M. W., *Heat and Thermodynamics*, McGraw-Hill, New York, 1943.

SUPLEMENTARY BIBLIOGRAPHY

on Meinong and the Theory of Objects

This bibliography extends the work of Lenoci 1970 up to 1978. It does not include works listed in the Bibliography above or in Lenoci. A more general bibliography on existence, Bradford 1976, does not cover work on Meinong and on the theory of objects.

Adams, M. M., "Ockham's nominalism and unreal entities", *Philosophical Review* **86** (1977) 144–176.

Astrada, C., "La 'Gegenstandstheorie' de Meinong", in his *Ensayos filósoficos*, Bahia Blanca, Universidad Nacional del Sur, Departamento de Humanidades, 1963, 213–228.

Barber, K., "Meinong's Hume Studies, Part I: Meinong's nominalism", *Philosophy and Phenomenological Research* **30** (1970) 550–567.

Barber, K., "Meinong's Hume Studies, Part II: Meinong's analysis of relations", *Philosophy and Phenomenological Research* **31** (1971) 564–584.

Bigger, C. P., "Objects and events", *Southern Journal of Philosophy* **11** (1973) 27–53.

Brody, B. A., "On the ontological priority of physical objects", *Nous* **5** (1971) 139–156.

Brown, H., "Perception and meaning", *American Philosophical Quarterly* **6** (1972) 1–9.

Buczynska-Garewixz, H., "Teoria wartosci Alexiusa Meinonga", *Etyka* **12** (1973) 57–77.

Butchvarov, P., "Identity", *Midwest Studies in Philosophy* **2** (1977) 70–89.

Campbell, R., "Did Meinong plant a jungle?", *Philosophical Papers* **1** (1972) 89–102.

Canfield, J. V., "Tractatus objects", *Philosophia* **6** (1976) 81–99.

Cargile, J. T., "The ontological argument", *Philosophy* **50** (1975) 69–80.

Cera, G., "Esistenza e realta", *Giornale Critico della Filosofia Italiana* **23** (1969) 548–560.

Chisholm, R. M., "Objectives and intrinsic value", in Haller 1972, 261–269.

Chisholm, R. M., "Thought and its reference", *American Philosophical Quarterly* **14** (1977) 167–172.

Cohen, D. L., "Kant's notion of the transcendental object and the noumena", *Dialogue* **15** (1972) 8–12.

Cornman, J. W., "Theoretical phenomenalism", *Nous* **7** (1973) 120–138.

Crawford, D., "Bergmann on perceiving, sensing and appearing", *American Philosophical Quarterly* **11** (1974) 103–112.

Crittenden, C., "Ontological commitments of everyday language", *Metaphilosophy* **5** (1974) 198–215.

Daniels, C. B. and Davison, J., "Ontology and method in Wittgenstein's 'Tractatus'", *Nous* **7** (1973) 233–247.

Devine, P. E., "Does St Anselm beg the question?", *Philosophy* **50** (1975) 271–281.

Dooyeweerd, H., "The epistemological Gegenstand-Relation and the logical Subject-Object relation", *Philosophia Reformata* **41** (1976) 1–8.

Dowling, E., "Intentional objects, old and new", *Ratio* **12** (1970) 95–107.

Dummett, M., "Frege's way out, a footnote to a footnote", *Analysis* **33** (1973) 139–140.

Eames, E. R., "Russell's study of Meinong", *Russell* **(4)** (1971) 3–7.

Enc, B., "Numerical identity and objecthood", *Mind* **84** (1975) 10–26.

Engelbretsen, G., "Meinong on existence", *Man and World* **6** (1973) 80–82.

Evans, G., "Identity and predication", *Journal of Philosophy* **72** (1975) 343–363.

Findlay, J. N., "Einige Hauptpunkte in Meinongs philosophischer Psychologie", in Haller 1972, 15–24.

Follesdal, D., "Husserl's theory of perception", *Ajatus* **36** (1974) 95–103.

Fotimis, A., "A critical evaluation of universals in nominalism", *Philosophia* (Athens) **3** (1973) 382–404.

Freed, B., "Beliefs about objects", *Philosophical Studies* **21** (1970) 41–47.

Gaifman, H., "Ontology and conceptual frameworks, part I", *Erkenntnis* **9** (1975) 329–353.

Gaifman, H., "Ontology and conceptual frameworks, part II", *Erkenntnis* **10** (1976) 21–85.

Gala, G. B., "Immediatezza e metdiazione della conoscenza dell'essere", *Gregorianum* **53** (1972) 45–87.

Givner, D., "To be is to be distinguished", *ldealistic Studies* **4** (1974) 131–144.

Grossmann, R., "Non-existent objects: recent work on Brentano and Meinong", *American Philosophical Quarterly* **6** (1969) 17–32.

Hacker, P. M. S., "Laying the ghost of the Tractatus", *Review of Metaphysics* **29** (1975) 96–116.

Haller, R., "Über Annahmen", in Haller 1972, 223–228.

Haller, R., "Meinongs Gegenstandstheorie und Ontologie", *Journal of the History of Philosophy* **4** (1966) 313–324.

Haller, R., "Über Meinong", *Revue Internationale de Philosophie* **27** (1973) 148–160.

Haller, R., "Perception and inference", *Ajatus* **36** (1974) 166–177.

Haller, R., "Osterreichische Philosophie", *Conceptus* **11** (1977) 57–66.

Harrison, F., "Metaphysics and common sense: an appraisal", *Philosophy Today* **14** (1970) 33–37.

Heaune, J., "The replacement of dependent clauses by infinitive expressions", in Haller 1972, 179–186.

Hill, C. S., "Toward a theory of meaning of belief sentences", *Philosophical Studies* **30** (1976) 209–226.

Hirsch, E., "Physical identity", *Philosophical Review* **85** (1976) 357–389.

Hochberg, H., "Rnssell's attack on Frege's theory of meaning", *Philosophica* **18** (1976) 9–34.

Hodges, M., "On 'being about'", *Mind* **80** (1971) 1–16.

Holmes, R., "An explication of Husserl's theory of the noema", *Research in Phenomenology* **5** (1975) 143–155.

Inwagen, P. Van, "Creatures of fiction", *American Philosophical Quarterly* **14** (1977) 299–308.

Jackson, F., "The existence of mental objects", *American Philosophical Quarterly* **13** (1976) 33–40.

Jacques, F., "Reference et description chez Meinong", *Revue Internationale de Philosophie* **27** (1973) 266–287.

Jorgensen, J., "Subject, object and knowledge", *Danish Yearbook of Philosophy* **6** (1969) 100–107.

Kerner, C., "Urteil und Gefühl, Glaube und Absicht", in Haller 1972, 229–244.

Kolnai, A., "Dignity", *Philosophy* **51** (1976) 251–271.

Korner, S., "On the identification of agents", *Philosophia* **5** (1975) 151–168.

Kraut, R., "On the philosophical relevance of possible-worlds semantics", *Philosophica* **18** (1976) 91–111.

Küng, G., "Noema und Gegenstand", in Haller 1972, 55–62.

Lackey, D., "Three letters of Meinong", in, vol. (Spring), 15–18.

Lambert, K., "Unmögliche Gegenstande: Eine Untersuchung der Meinong-Russell Kontroverse", *Conceptus* **11** (1977) 92–100.

Lambros, C. H., "Are numbers properties of objects?", *Philosophical Studies* **29** (1976) 381–389.

Landesman, C., "Thought, reference and existence", *Southern Journal of Philosophy* **13** (1975) 449–458.

Langtry, B. N., "Identity and spatio-temporal continuity", *Australasian Journal of Philosophy* **50** (1972) 184–189.

Laycock, H., "Some questions of ontology", *Philosophical Review* **81** (1972) 3–42.

Lenoci, M., *La teoria della conoscenza in Alexius Meinong: Ogetto, giudisio, assunzioni*, (*Scienze filosofiche,* 4), Vita e Pensiero, Milan, 1972.

Lenoci, M., "Problema del riferimento e teoria delle descrizioni: un bilancio recente", *Rivista de Filosofia Neo-Scolastica* **64** (1972) 94–106.

Lewis, D., "Truth in fiction", *American Philosophical Quarterly* **15** (1978) 37–46.

Lindenfeld, D., "Meinong, the Würzburg School, and the role of experience in thinking", in Haller 1972, 117–125.

Locke, D., "Zombies, schizophrenics and purely physical objects", *Mind* **85** (1976) 97–99.

Loux, M. J., "The concept of a kind", *Philosophical Studies* **29** (1976) 53–61.

Marcus, R. B., "Essential attribution", *Journal of Philosophy* **68** (1971) 187–202.

Meinong, A., "Über Inhalt und Gegenstand (Fragment)", *Conceptus* **11** (1977) 67–76.

Montero, F., "La ambigüedad del fenómeno en la filosofía de Kant", *Pensamiento* **32** (1976) 5–22.

Moore, A., "Composition", *Monist* **55** (1971) 163–181.

Morscher, E., "Von Bolzano zu Meinong: Zur Geschichte des logischen Realismus", in Haller 1972, 69–102.

Morscher, E., "Meinongs Bedeutungslehre", *Revue Internationale de Philosophie* **27** (1973) 178–206.

Munsat, S., "The objects of knowledge and belief: some linguistic considerations", *Dialogue* **16** (1977) 575–590.

Neujahr, P. J., "Subjectivity", *Philosophy Research Archives* **2**.1110 (1976).

Noonan, H. W., "Dummett on abstract objects", *Analysis* **36** (1976) 49–54.

Noonan, H. W., "Sentences and names in Frege", *Analysis* **36** (1976) 188–190.

Noonan, H. W., "Tractatus 2: 0211–2: 0212", *Analysis* **36** (1976) 147–149.

Nyairi, J. C., "Beim Sternenlicht der Nichtexistierenden: zur ideologie-kritischen Interpretation des platonisierenden Antipsychologismus", *Inquiry* **17** (1974) 399–443.

Oosthuizen, D. C. S., "About 'about'", *Philosophical Papers* **2** (1973) 16–31.

Orayen, R., "Sobre la inconsistencia de la ontología de Meinong", *Cuadernos de Filosofía* **10** (1970) 327–344.

Pears, D., "The ontology of the 'Tractatus'", *Teorema Mono* (1972) 49–58.

Poser, H., "Der MöglichkeitsbegriffMeinongs", in Haller 1972, 187–204.

Purtill, R., "Meinongian deontic logic", *Philosophical Forum* **4** (1973) 585–592.

Quine, W. V., "Grades of discriminability", *Journal of Philosophy* **73** (1976) 113–116.

Raval, R. K., "An essay on 'phenomenology'", *Philosophy and Phenomenological Research* **33** (1972) 216–226.

Reichenschuh, C., "Über den Begriffdes Wertes bei Meinong", in Haller 1972, 245–260.

Sallis, J., "Image and phenomenon", *Research in Phenomenology* **5** (1975) 61–75.

Sanford, D. H., "The primary objects of perception", *Mind* **85** (1976) 189–208.

Schermann, H., "Husserls II. logische Untersuchung und Meinongs Hume-Studien I", in Haller 1972, 103–115.

Schleichert, H., "Nochmals über Annahmen", *Conceptus* **11** (1977) 124–128.

Schock, R., "A note on possible object logics", *Australasian Journal of Philosophy* **48** (1970) 261–263.

Schwartz, E., "Remarques sur 'L'espace des choses' de Wittgenstein et ses origines fregéennes", *Dialectica* **26** (1972) 185–226.

Scruton, R., "Intensional and intentional objects", *Proceedings of the Aristotelian Society* **71** (1970–71) 187–207.

Smith, B., "The ontogenesis of mathematical objects", *Journal of the British Society for Phenomenology* **6** (1975) 91–101.

Smith, D., "Meinongian objects", *Grazer Philosophische Studien* **1** (1975) 43–71.

Sosa, E., "On the nature and objects of knowledge", *Philosophical Review* **81** (1972) 353–367.

Sosa, E., "Russell, Berkeley y la materia objetiva", *Crítica* **7** (1975) 35–41.

Srzednicki, J., "Reference and description", *Theoria* **36** (1970) 127–141.

Stanovici, V., "L'entropie et la negentropie de la catégorie de modalité", *Philosophie et Logique* **19** (1975) 135–141.

Stevenson, L., "Frege's two defintions of quantification", *Philosophical Quarterly* **23** (1973) 207–223.

Teistenjak, A., ed., *Vom Gegenstand zum Sein: von Meinong zu Weber.* In honorem Francisci Weber octogenarii, Trofenik, München, 1972.

Thalberg, I., "Ingredients of perception", *Analysis* **33** (1973) 145–155.

Tichý, P., "What do we talk about?", *Philosophy of Science* **42** (1975) 80–93.

Tietz, J., "Emotional objects and criteria", *Canadian Journal of Philosophy* **3** (1973) 213–224.

Toit, A. B. Du, "Logic and ontology", *Philosophical Papers* **3** (1974) 17–45.

Webb, C. W., "Spatiotemporal objects", *Journal of Philosophy* **68** (1971) 879–890.

Weinberger, C., "Die Annahme als Kategorie der Wissenschaftssprache", *Conceptus* **11** (1977) 101–123.

Weinberger-Gailhofer, C., "Pflichtenkonflikt und normen-logischer Widerspruch", in Haller 1972, 287–294.

Williams, C. J. F., "Prior and ontology", *Ratio* **15** (1973) 291–302.

Wolf, K., "Der Bedeutungswandel von 'Gegenstand' in der Schule Meinongs", in Haller 1972, 63–68.

Wolf, K., "Ernst Mallys Destruktion des Meinongschen 'Gegenstandes'", in *Akten des XIV. Internationalen Kongresses für Philosophie*, (Vienna, September 1968), vol. 6, Vienna, Herder, 1971, 584–591.

Zecha, G., "Meinongs moralische Wertklasses und die deontischen Operatoren", in Haller 1972, 271–286.

SUPPLEMENTARY ESSAYS

Why item theory doesn't (quite) go far enough

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One doesn't often get the chance to write a paper arguing that Richard Sylvan did not go far enough: the general opinion is that in almost everything he went far too far. But nonetheless, with more than thirty years' hindsight, one can see *Exploring Meinong's Jungle and Beyond* (*EMJB*) as a revolution stalled halfway.[1] This, at any rate, will be my contention in this paper. To argue this, of course, is not to deny how revolutionary the ideas in *Exploring Meinong's Jungle* were, especially when they were first put on paper in the conservative 1960s.[2] In those days, the slightest deviation from Russellian and Quinean orthodoxy was looked on as radical. Nonetheless, I shall argue that the devices Sylvan uses to defend Meinong's original theory against well-known counter-examples going back to Russell significantly limit its power, lack (adequate) justification independent of the counter-examples they are designed to block, and are in fact unnecessary.

The counter-examples all arise from the tension between two of Meinong's fundamental principles: unlimited freedom of assumption and (what Sylvan called) the characterization postulate. Freedom of assumption asserts that we can assume whatever we like and that, whatever assumption we make, there will be an item about which we make it.[3] Putting this into the sort of language that Sylvan uses, we have:

(FA) However we characterize an item, there is an item thus characterized.

[1] This, incidentally, was Sylvan's view of free logic. Cf. Routley and Routley 1973.

[2] See, in particular, the series of three papers published in the *Notre Dame Journal of Formal Logic* (Routley 1966; 1969; 1970) and the two long unpublished typescripts (Routley c.1967; 1968) which are the basis of the first two chapters of $EMJB_1$ – reprinted in $EMJB_2$ this volume, chapter 1 and Vol. 2, chapter 2.

[3] See, e.g., Meinong 1904, p. 92 (GA 2, p. 500); 1910, pp. 246–8, 252, (GA 4, pp. 346–8, 354); 1915, p. 282; 1917, pp. 24–5 (GA 3, p. 28). The term "assumption" (*Annahme*) is, of course, Meinong's and has stuck, despite being seriously misleading since what is assumed is typically taken to be true if only for the sake of argument. "Supposition", which carries no such suggestion and is also an admissible translation

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Essentially any well-formed, monadic sentence-frame can be used to characterize an item,[1] so (FA) supplies the theory with its enormous range of items. The (unrestricted) characterization postulate then specifies their basic properties, namely:

(CP) An item has all those properties which characterize it.[2]

Each principle has a great deal to commend it. To assume something, for Meinong, is just to put it forth for consideration, and anything may thus be assumed. To maintain that there are assumptions we cannot make, is already to have made them. Moreover, assumptions have subjects; they are about something, some item or other. To maintain that an assumption, supposedly about some particular item, is not really about that item but about some other item (or perhaps about no item at all, or about every item) is to make a different assumption. And what properties should a non-existent object have if not those which characterize it? As Priest puts it:

> It would seem that these objects must, in some sense, have the properties they are characterized as having. If they didn't, we wouldn't know what we were talking about when we talk about them.[3]

If one makes an assumption about a winged horse, then it is about a horse that has wings that one makes it. That is, the item about which your assumption is made is one which has both the property of being a horse and the property of having wings. No other item, no item which lacks either of these properties, will do; nor will an item that has them, but only in some weak, substandard way, such that it wasn't *really* true that it had them. Both of these would constitute different assumptions.

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of "*Annahme*", would be better. (Russell may not have introduced "assumption" as a translation of Meinong's "*Annahme*", but his use of it in Russell 1904 was no doubt influential in ensuring its popularity.) Sylvan offers a number of variants ($EMJB_1$, p. 529; i.e. $EMJB_2$ Vol. 2, chapter 6, §4.1) and on p. 599 (i.e. $EMJB_2$ Vol. 2, chapter 7, §10.2) proposes (what seems best of all) a freedom of imagination principle instead: we can imagine whatever we like. Nonetheless, "assumption" is the term he typically uses and I shall follow him in that.

[1] Cf. Sylvan 1995, p. 52; reprinted here, p. 550. (With any sentence-frame "ϕx" we can characterize the item $(\imath x)(\phi x)$.) Sylvan said relatively little about freedom of assumption in *EMJB* (though see $EMJB_1$ pp. 529–30 – i.e. $EMJB_2$ Vol. 2, chapter 6, §4.1) compared to the characterization postulate, which gave him a lot more trouble.

[2] In earlier writings (e.g. Routley and Routley 1973) and occasionally in *EMJB* (e.g. $EMJB_2$ this volume, pp. 59, 331; $EMJB_1$, pp. 420 (i.e. $EMJB_2$ Vol. 2, chapter 3), 532 (i.e. $EMJB_2$ Vol. 2, chapter 6, §4.2)), Sylvan called (CP) the "assumption postulate" , terminology which reflects the theory's Meinongian origins. (The terminology is explained at $EMJB_2$ this volume, p. 331). To my knowledge, Meinong nowhere states (CP) in its full generality as a principle. Nonetheless, he does appeal to it implicitly in his treatment of examples (cf. Meinong 1904, p. 82 = GA 2, p. 490).

[3] Priest 2005, p. 83.

I shall call the theory that maintains the unrestricted characterization postulate and unlimited freedom of assumption "naive item theory" on analogy with naive set theory. Like naive set theory, naive item theory, for all its simplicity and the appeal of its founding principles, is open to serious counter-examples. And they arise in a similar way, for the unrestricted characterization postulate plays an analogous role in naive item theory to the role played by the unrestricted comprehension axiom in naive set theory. The counter-examples which force us to abandon naive item theory fall into three types. I give one example of each:

1. *Consistency Counter-examples*: By (FA), we can talk about the round square; by (CP), the round square will be round and square. But since being square entails being not round, the round square will be both round and not round. Thus the theory entails inconsistencies.

2. *Status Counter-examples*. By (FA) we can not only make assumptions about the golden mountain, but also (and differently) about the existing golden mountain; by (CP), while the golden mountain is golden and mountainous, the existing golden mountain is golden, mountainous and exists. But no golden mountain exists. Thus the theory entails status claims about items at variance with known facts.

3. *Relational Counter-examples*. By (FA), we can talk about the man (call him "Gilles") who was married to Joan of Arc; by (CP), Gilles was married to Joan of Arc.[1] Since marriage is a symmetrical relation, it follows that Joan of Arc was married to Gilles and, thus, that Joan of Arc was married. But Joan of Arc was never married. Thus the theory entails claims about existing items at variance with known facts.

The consistency and status counter-examples were first advanced against Meinong's theory by Russell (1905, p. 418; 1905a, pp. 598–9; 1907, pp. 691–2) and the relational counter-examples by John Woods (1969; 1974, pp. 42ff, 135ff). Traditionally, item theorists have attempted to block the counter-examples by restricting either (FA) or (CP) or both. Different authors have imposed different restrictions (sometimes with mitigations of various sorts) resulting in a variety of positions which I shall collectively call classical item theory.

Meinong himself offered replies to Russell's objections and Sylvan (to some extent) follows him in treating these. In the case of the consistency counter-examples, Meinong

[1] The example comes from $EMJB_2$ this volume, p. 348.

made valiant efforts to preserve the consistency of his theory by drawing a distinction in effect between sentential and predicate negation. Having the property of being not round, he argued, is not the same as not having the property of being round. The round square cannot both have and not have the property of being round, but it does have both the property of being round and the property of being not round. So the law of non-contradiction holds for sentential negation but not for predicate negation (Meinong 1915, pp. 171–4).

One might have expected Sylvan to follow a more resolutely paraconsistent line, acknowledging that items like the round square were exactly what they seemed: genuinely contradictory items, items which have a pair of properties one of which precluded them from having the other. By the time *Exploring Meinong's Jungle* was published Sylvan was already investigating dialethic logics (see e.g., Routley and Routley 1975, and Routley and Meyer 1976), and dialethic forms of item theory are mentioned in the book (and generally favourably; e.g. $EMJB_2$ this volume, pp. 16n, 291, 354n, 384–386, 389; $EMJB_1$, p. 582 – i.e. $EMJB_2$ Vol. 2, Chapter 7, §7 – discussion of F*) but little is done to develop them (apart from the suggestions in $EMJB_2$ Vol. 2, chapter 5) and the theories which dominate the book are consistent ones.

This is certainly one respect in which the theory should go further, and Sylvan would most likely have agreed. In Chapter 1 §10, before setting out his consistent version of the theory with sentential and predicate negation he mentions dialethic alternatives:

> A major option – not to be lightly dismissed, though the ideas involved run completely counter to the philosophical tenor of the times – is that a really satisfactory theory of objects will be a nontrivial inconsistent theory. But this is not really an historical option.[1]

But this was not really true in 1981. By the time *Meinong's Jungle* was published considerable work was being done on dialectical logic: Priest's work had already begun (Priest 1979), there was that of Sylvan himself and Meyer mentioned above; as well as much earlier work going back to the doctoral theses of Asenjo 1954 and da Costa 1963.[2] I suspect that what ruled dialethic item theory out as a historical possibility for

[1] $EMJB_2$ this volume, p. 112.

[2] Nor was this work confined to the usual suspects, philosophers whose names are likely to be familiar to readers of *Meinong's Jungle*. Reviving interest in Hegel in the 1970s extended to his logic and its formalization. The results were often not inspiring (e.g. Kosok 1972 and Lachterman 1980), but Thagard 1982 is of interest.

Exploring Meinong's Jungle was that the core of the book had been drafted as early as 1967–8 (Routley c.1967, 1968). A resolutely dialethic approach would have required major re-writing: the book may never have been finished.

In this respect, I think that when *Exploring Meinong's Jungle* appeared the revolution had already preceded it. Once paraconsistent carrier logics were available (so that contradictions wouldn't detonate and render the theory trivial), there really was no need to try to block the consistency counter-examples by restricting (CP). (CP) assigns truth values a priori to statements about nonexistent objects. That it assigns them inconsistently to some statements about inconsistent objects should worry no one, so long as the carrier logic is paraconsistent. No doubt it is nice to know that consistent versions of the theory are possible, but really they are markedly inferior to the inconsistent ones. The distinction between sentential and predicate negation is a messy one and an appropriate notion of predicate negation has not, I think, been adequately made out (Griffin 2008).[1] But even supposing that it had been, the resulting consistent version of item theory would still be unsatisfactory, for freedom of assumption would be compromised. If predicate negation really is distinct from sentential negation, then the assumption that the round square is non-round (where "non-" indicates predicate negation) is a different assumption from the assumption that the round square is not round (where "not" indicates sentential negation). If assumption is free then, as Sylvan implicitly acknowledges ($EMJB_2$ this volume, p. 379), we should be able to make assumptions about a round square which is *sententially* not round (call it the robustly round square) as well as about, what is different, a round square which is predicatively not round (the weakly round square). Indeed, anyone who has not been privy to Meinongian thinking about predicate negation would naturally suppose that it was the former they had been thinking of all along. The robustly round square is not some especially esoteric object conjured up to make trouble for item theory: it is, one would suppose, the *default* object when round squares are under discussion. Yet to save consistent item theory, assumptions about the robustly round square have to be re-construed as assumptions about the weakly round square. The only way to pretend that this doesn't matter is to suppose that the distinction between predicate negation and sentential negation doesn't matter, that there is no real difference between the two.

[1] Other criticisms can be found in Jorgensen 2004 and Swanson 2011, Ch. 2.

Are we thus to abandon the law of non-contradiction as a thesis of the carrier logic for item theory in the face of items like the round square? Certainly not: we should avoid any idea of weakening our logic in the face of counter-examples thrown up by freedom of assumption. We would, for example, have to give up the law of excluded middle as well for the sake of the item which is neither round nor not round. And such moves can be indefinitely extended: consider *any* logical law, L, by freedom of assumption there will be the item $(\imath x)\sim L$. By (CP), $\sim L$ will be true. It would follow, then, that no law of logic holds, that item theory has no logic. But things are worse even than this. For suppose that P is any claim of any kind whatsoever. By (FA), there is the item $(\imath x)\sim P$. By (CP), it follows that $\sim P$ is true. So item theory would be trivial: every claim (and its negation) would be true. On this showing, it would seem essential that some restriction, either of (FA) or (CP), be imposed. And yet we still need to make room within item theory for assumptions which undermine any given logical principles or even all of them together[1] and even for trivializing assumptions which make every claim true.

Turning now to the status counter-examples, Meinong (following the lead of his student, Mally) availed himself of the long philosophical tradition which held that "exists" is not an ordinary predicate and drew a distinction between *Sein* (being) properties and *Sosein* (being so) properties, a distinction which became enshrined in Mally's famous Independence Thesis:

(IT) *Sosein* is independent of *Sein*.[2]

Read one way, (IT) is the lowest common denominator of any sort of Meinongian theory: that an item's having *Sosein* properties does not depend on its having (appropriate) *Sein* properties. So read, (IT) is simply the negation of the widely-held anti-Meinongian thesis that Sylvan calls the Ontological Assumption ($EMJB_2$ this volume, p. 28), the lowest common denominator of reference theories of all kinds:

(OA) Only existents have properties.

[1] Such suggestions are already on the table, see e.g., Gillian Russell 2015 – and she eschewed the Meinongian method of free assumption as too easy a method for generating them. She considered abandoning only those laws against which *a* case (of some kind or other) could be made. It turned out that little, if anything, was left. Logic-busting items, like $(\imath x)x \neq x$, are not monsters to be found only in the swamps of Meinong's jungle, there may well be reasons for taking them into consideration quite apart from the latitude accorded them by freedom of assumption.

[2] Mally (1904, p. 126); Meinong (1904, p. 82 = GA 2, pp. 489–90).

But one can equally well read (IT) as asserting that one cannot simply read offan item's *Sein* properties from the *Sosein* properties which characterize it. If, by (FA), we simply characterize an item as existing, i.e. treat existence as one of its *Sosein* properties, we cannot infer from that that it exists, i.e. predicate a genuine *Sein* property of it. "*[A]ssumptions*", as Sylvan says, "do not, and *should not settle the ontological or modal status of assumed items*" ($EMJB_2$ this volume, p. 332).

The *Sein*/*Sosein* distinction, taken at face value, does not go far enough, for there are status properties that have nothing to do with *Sein*. It is not *exactly* clear which further properties should be included, but some extensions are uncontroversial and can easily be supported by counter-examples to (CP). Modal properties (e.g., "actual", "possible", "contingent", etc.) are all status properties and so are many others like "valid", "consistent", "simple", "unique", "true", and "known".[1] Meinong later (1915, pp. 176–7) supplemented the *Sein*/*Sosein* distinction with a broader one between "*konstitutorische*" and "*ausserkonstitutorische*" properties, for which Findlay introduced the English terms "nuclear" and "extra-nuclear" (Findlay 1933, p. 176). An item's extra-nuclear properties include, but are not limited to, its *Sein* properties.[2] The standard approach, which is the one that Sylvan follows, is to restrict (CP) so that it holds for nuclear properties only. The burden of blocking the counter-examples is thus borne by the restrictions on (CP) and the virtue of this is that it leaves freedom of assumption absolutely unrestricted.

This, however, is a rather obscure virtue, for we are invited to suppose that we can make assumptions about the existent golden mountain, distinct from assumptions about the golden mountain *simpliciter*, even though both lack the property of existence. Since they share all their other properties, one wonders, how the two items (and likewise the two assumptions) are to be distinguished from one another? Meinong's answer is his doctrine of the modal moment (Meinong 1915, pp. 266ff): extra-nuclear (status) properties can be used to make assumptions, but in such cases they are used only in a "watered-down" (*depotenzierte*) form (1915, p. 282), which lacked what Meinong called the "modal moment". The item assumed has the watered-down extra-nuclear properties

[1] Sylvan, more contentiously, includes "is created" and "dies" ($EMJB_2$ this volume, pp. 3, 37n, 346). One wonders, then, on what ground he might exclude "was appointed president" or "was disassembled". One suspects there may be a lurking, unacknowledged essentialism, which ought not to be built into the foundation of item theory.

[2] Sylvan uses "characterizing" and "non-characterizing" (and sometimes "assumptible" and "non-assumptible") for essentially the same distinction ($EMJB_2$ this volume, p. 59).

which characterize it, but does not have them in their full-strength, modalized versions.[1] Parsons 1980 develops this approach formally and postulates that every extra-nuclear property has a watered-down companion.

Sylvan, however, has nothing to do with this approach, and I think for good reason. It has never been made clear what modalizing or watering-down amounts to.[2] By the same token, it is not clear how the absence of modalized or full-strength properties available for characterizing the objects of assumption is mitigated by the availability for that purpose of their watered-down companions. The mitigation is only really adequate to the demands of free assumption if the two properties are one and the same. Moreover, as was the case with predicate and sentential negation, it is the (robust) non-characterizing version that would naturally be considered the default. Imagine someone who knows that there are a lot of fictions about Sherlock Holmes, but who believes there actually existed a late-nineteenth-century detective called Sherlock Holmes, who did some (at least) of the things Conan Doyle described. When that person insists, "I'm talking about the real Sherlock Holmes", "real" is surely intended here in its modalized, full-strength sense. It does the speaker (and their assumption) no favours to suppose that "real" could only have been used in its watered-down form.

To my mind none of the extant defences of item theory against the consistency and status counter-examples is entirely satisfactory. All involve some restriction of (FA) or (CP) or both and the mechanisms proposed to mitigate these restrictions are messy, obscure and not entirely effective. Nonetheless, I think classical item theory would be defensible were it not for the relational counter-examples. Against these, I think no remotely satisfactory defence has been offered. The basic problem with relational counter-examples is that, when a non-existent item is characterized by means of a relation to an item which exists, the non-entity will have that relation to the entity, by (CP), and from this we can infer that the entity will have the converse relation to the non-entity, a conclusion which in many cases will be false. Thus, in my example, the non-existent Gilles is characterized as married to Joan of Arc, but she is not married to Gilles or, indeed, to anyone. Similarly, Sherlock Holmes is characterized as living in London but London never included Holmes among its inhabitants.

[1] In Meinong's system watering down and modalizing are inverse operations. Findlay's account of modalizing (Findlay 1933, Ch. 4) is much clearer than Meinong's.

[2] It bears some resemblance to the idea of existentially loading predicates which Sylvan considers and rejects at $EMJB_1$, p. 582 (i.e. $EMJB_2$ Vol. 2, chapter 7, §7), option (G2).

Parsons proposes "plugging up" relations to make one-place properties (1980, pp. 26–7, 59–60, 75–7). In the case of a two-place relation R, we can plug up its second argument place to make the property $\lambda x(x[Ry])$ or plug up its first place to make the property $\lambda y([xR]y)$. Normally, we would have

(A) $x[Ry]$ iff $[xR]y$,

but Parsons holds that (A) fails where one of the related terms is non-existent. Thus, Gilles has the one-place property of being married to Joan of Arc; but Joan does not have the one-place property of being married to Gilles. This, at least, is a straight-forward and relatively elegant solution, though it fails to explain why (A) fails and in what sense Gilles can be properly said to be married to Joan if Joan is not married to Gilles when marriage is supposed to be a symmetrical relation. Moreover, assumption is still not free, for Parsons would prohibit us from identifying Gilles as $(\imath x)$([x was married to] Joan of Arc) or for that matter as $(\imath x)$(Joan of Arc was married).[1] On Parson's theory Gilles must always be $(\imath x)(x$ [was married to Joan of Arc]).

Sylvan likewise claims we cannot infer that Joan was married to Gilles from the fact Gilles was married to Joan, but his ground for this depends on his distinction between entire relations, which carry a full range of entailments, and reduced relations, which do not ($EMJB_2$ this volume, pp. 350–351). Sylvan wants to say that it is true that Gilles is married to Joan, but not entirely true ($EMJB_2$ this volume, p. 351). From the not-entire truth that Gilles is married to Joan it cannot be inferred that Joan is married to Gilles. Sylvan's diagnosis of the problem is that the transformation from active to passive voice fails, which makes it seem as if what has gone wrong is a grammatical rather than a logical matter (p. 349).[2] As with Parsons' proposal, freedom of assumption would seem to be limited. Gilles cannot be identified as the person to whom Joan is married, nor can we assume that the predicate "was married to Gilles" can be applied to Joan. As always, Sylvan keeps (FA) unlimited by imposing limits on (CP): the source text for Gilles may predicate "was married to Gilles" of Joan, but the predicate is not characterizing. Sylvan justifies this on the ground that the verb is in the passive voice, according to him "only

[1] Once again, this last item is not an obscure logical fabrication intended to embarrass item theorists. It is usually called a spouse.

[2] Sylvan says that "central logical principles are not being upset" ($EMJB_2$ this volume, p. 349), but that (I shall argue) is extremely doubtful.

active forms [are] characterising" ($EMJB_1$, p. 586 – i.e. $EMJB_2$ Vol. 2, chapter 7, §7). In fact, however, the active/passive distinction is irrelevant. Consider a Sherlock Holmes source text which states "Gladstone gave instructions to Holmes". Despite the active voice, this is not characterizing of Gladstone, for it is not, by Sylvan's lights, true of him. On the other hand, despite the passive, "was given instructions by Gladstone" does characterize Holmes.

The relational counter-examples arise when, in the course of characterising non-entities by means of relations, properties (relational and other) are assigned to entities which they don't in fact have. The only thing that matters here is whether the item of which the predicate is predicated exists or not. If it doesn't, the predication is fine (even if, granted paraconsistency, the predication is inconsistent with other things already predicated of it). If it does, then the predicates ascribed to it have to be consistent with those it actually has. The *manner* in which the predicates are ascribed – whether they are ascribed by locutions in the active or passive voice, or whether they are ascribed to items which the ascription is "principally about" ($EMJB_1$, p. 585 – i.e. $EMJB_2$, Vol. 2, chapter 7, §7) or which are referred to by expressions occupying first argument-place in the ascriptions (a mode of presentation Sylvan also privileges, $EMJB_1$, p. 587 – i.e. $EMJB_2$, Vol. 2, chapter 7, §7) – doesn't matter.

Moreover, central principles of the logic of relations *are* involved. The active to passive transformation is simply the grammatical means of transforming a relational statement using R into an equivalent using the converse of R. Since "is married to" is symmetrical, it is its own converse and the failure of the transformation in the case of Joan of Arc's husband signals the failure of symmetry of the relation. But symmetry only fails for relations holding between entities and non-entities. Symmetrical relations between two non-existents do not cause the same problems – at least if both are in the same story. Anna Karenina is married to Alexei Karenin and he is married to her. On the other hand, Anna's lesbian lover loves Anna, though Anna does not love her because she is not in the novel. Moreover, not all symmetrical relations between entities and non-entities cause problems: if Holmes has the same birthday as Gladstone, then Gladstone has the same birthday as Holmes. And some asymmetrical relations do cause problems. If we identify the non-existent Elfrieda as Hitler's daughter (to take up an example of Pears 1967): by (CP), she was indeed Hitler's daughter, but the kinship relation must be reduced, for Hitler was not her father. But, again, not all asymmetrical relations are

problematic, *even when they hold between entities and non-entities*. Comparatives, for example, do not cause problems: if Sherlock Holmes is taller than Russell, then Russell is shorter than Holmes. And curiously, transitivity does not fail: If Sherlock Holmes lives in London and London is in England it follows that Holmes lives in England.[1] Other forms of compounding are messier. Joan of Arc had a brother Jean, so Gilles was Jean's brother-in-law, though Jean was not Gilles' brother-in-law. Though if Gilles had a brother Pierre, Pierre would be Joan's brother-in-law but Joan would not be Pierre's sister-in-law. And if we supposed that Gilles were the brother of some actually existing person, say Henri, then Gilles would be Henri's brother (but not vice-versa) while neither Henri nor Joan would be in-laws.

It is very difficult to discern any principles which might bring order here. It seems rather that the reduction policy, if it is to work, must be a series of expedients patched together to fend offunwanted results. Parsons' plugging-up procedure has the advantage of being uniform across all relations between entities and non-entities. The drawback to that uniformity is precisely that it fails to track the apparent vagaries of relational characterization and sometimes gets things wrong. As Parson's himself notes, it fails with comparatives, which leads Parsons to suggest that comparatives are extra-nuclear (1980, pp. 168–70). But this, also, is unsatisfactory. A good deal of characterization of non-existents depends upon comparatives – for example, Anselm's characterization of God as "that than which nothing greater can be conceived". And in fiction a fairly standard way of characterizing non-existent items, especially fabulous ones, is by comparison with existing items (or items in other fictions) with which the reader is presumed to be familiar. Moreover, on Parsons' proposal, even intra-fictional comparison would be watered-down: Holmes would no longer be cleverer than Lestrade, Vronsky would not be more attractive than Alexei Karenin. It would be a serious loss if items could have comparative properties only in some obscure watered-down sense.

The problems of classical item theory arise because of the huge range of different types of items about which assumptions can be made and the vast diversity of assumptions that can be made about them, including conflicting assumptions often made about the same item. The realm of assumption is, *at the very least*, almost unimaginably vast, and could be a good deal vaster than that. Certainly it exceeds the imagination of any one

[1] Needless to say, reflexivity (to round out our consideration of the formal properties of relations) never causes a problem.

or any group of us and, rightly interpreted, that of all of us put together. And while much of it is relatively banal, parts of it are exceedingly bizarre, violating standards of logic, cogency, common sense, scientific enquiry and any metaphysical postulate that has ever been proposed. But even the banal parts can cause trouble, as for example, when conflicting assumptions are made about a fictional character. The main difficulty here occurs, not so much when authors make mistakes (though that, too, deserves attention), as when they deliberately offer conflicting narratives (e.g. alternative endings), or when fan fiction diverges from the original. Such cases as these cannot be accommodated by treating the items concerned as inconsistent items. The hero, in a case of alternative endings, doesn't *both* die *and* live happily ever after. Nor does Sherlock Holmes violate the law of non-contradiction if a politically correct fan fiction describes him as being vehemently opposed to tobacco. From a logical point of view he is quite banal; indeed, it is his logical banality that makes the difficulty.

Classical item theory attempts to evaluate the entire realm of assumption within a single semantic framework – essentially that provided by the actual world, for it is with respect to the actual world that classical item theory assigns truth-values to statements about non-entities. This is Sylvan's "factual world", T, the world which reveals what actually is the case, whether about entities or non-entities. In *Meinong's Jungle* truth is defined in terms of holding in T ($EMJB_2$ this volume, p. 264). Ironically, in this, classical item theory follows the lead of the earlier referential theories, which Sylvan rightly excoriated ($EMJB_2$ this volume, chapter 1, §6). True, the resources of the referential theories are augmented in classical item theory by adding non-existent items to the domain. The domain $d(T)$ of T is vastly greater than the domain of the referential world G which contains only existents ($EMJB_2$ this volume, p. 266). As a result, Sylvan can rightly claim (see $EMJB_2$ this volume, pp. 23, 39, 467–467 for evidence) that "Sherlock Holmes is a detective" holds in T, and is thus true, though it does not hold in G because Holmes is not an element of $d(G)$. Despite its initial plausibility, there are problems with this as will be discussed below. But even setting these aside, it is not really enough.

Exceptions have to be made, as Sylvan notes ($EMJB_2$ this volume, pp. 266–267), for ascriptions of status properties and intensional properties. And even for statements which ascribe non-status or extensional properties many of the truth-values thus assigned are at odds with what is actually the case in the factual world. Unsurprisingly, the worst (though not the only) problems of this sort arise in the case of relations which

hold between entities and non-entities. This can be avoided in classical item theory by quarantining the non-entities, that is by denying that entities have any extensional relations to non-entities. And this, in a qualified and somewhat roundabout way, is what Sylvan does with his doctrine of reduced relations. With hand-picked exceptions, non-entities have no (full-strength) extensional relations to entities. Instead they have reduced (or watered-down) surrogate relations, which relate the non-entity to the entity but not vice-versa. In this way they deliver needed truths about the non-entities without unneeded falsehoods about the entities.

Classical item theory's treatment of relations is on a par with its response to the consistency and status counter-examples. The consistency counter-examples do not result in contradictions, where both Fa and $\sim Fa$ are true, but only in a clash of properties, where a is both F and non-F; the status counter-examples do not result in falsehoods, for non-existent items are either never characterized by status properties or, if they are, do not actually have the status properties which characterize them (appearances to the contrary being preserved, on some versions of the classical theory, by surrogate, watered-down properties). In all three cases, either one or both of (FA) and (CP) are restricted. Assumption, therefore, is not taken at face-value but is manipulated (often in *ad hoc* ways) to make it fit within a single coherent framework, that provided by T. Sylvan's charge against the referential theories was that they required the re-formulation of a lot of ordinary discourse – discourse that was, as Sylvan often tells us, perfectly all right as it stood – in order to make it fit within the narrow referentialist framework, G, which allowed reference only to entities. Classical item theory liberalizes the framework a good deal by admitting non-existent items, but still requires the items to be in various ways well-behaved if they are to fit within the extended framework T without trivializing it. The three types of problem discussed in the previous section arise because simply breaking the referentialist identification of T with G, as Sylvan does ($EMJB_2$ this volume, p. 267), does not go far enough. The reformulation of discourse to fit T is less draconian than that required to fit G, but classical item theory still forces language (and assumption) onto a Procrustean bed. The bed is just considerably larger.

The first step in solving these problems is to eliminate the *semantic* privilege classical item theory gives to T.[1] This is really a relic of traditional reference theories

[1] It is only the *semantic* privilege of T that needs to be eliminated. In other respects, for ecology or engineering e.g., the factual world, T or maybe even G, deserves its privilege: it is, after all, the world we live in, we depend on its ecology and mess it up with our engineering.

and in fact constitutes a significant part of the prejudice in favour of the actual that Meinong inveighed against. But it will not do to transfer the semantic privilege accorded T to some other world. The idea behind that would be to privilege a more accommodating world, a sort of minimalist framework which would not constrain assumption, in which, that is, whatever may be assumed is true. But this will not work at all. Suppose w_0 is such a world. w_0 will have a very relaxed logical structure: it will allow violations of the law of non-contradiction in order to accommodate inconsistent items, and violations of the law of excluded middle to accommodate incomplete items. Indeed, to suppose that w_0 has *any* logical structure at all, is to place limits on what can be assumed. It supposes that a violation of that structure is simply unthinkable, literally beyond the wildest imagination. By the terms of item theory with unlimited freedom of assumption, there surely is such a world as w_0, but it is no candidate for the factual world, indeed it is remote even among impossible worlds. But if we don't choose w_0, the world which least constrains assumption, what other world could we choose? No world comes with a built-in semantic privilege.

The only solution is to end the privilege Sylvan accords T and not transfer it to any other world. The actual world, henceforth designated by "@", does not provide an "absolute framework" (as Sylvan sometimes calls it, $EMJB_2$ this volume, p. 267) at all. It is, in most cases, the *default* framework, the framework within which semantic assessments are made in the absence of indications to the contrary. It is, after all, the world we live in and demands our respect for that reason, if no other. Beyond that, from the point of view of the semantic theory (but, importantly, *only* from that point of view), all worlds are equal. My claim is that for *every* assumption there is some world in which that assumption (without revision, reconstruction or watering-down) is true. The idea is that freedom of assumption holds without restriction – whatever assumption is made there is some world (however weird) in which the item about which it is made is to be found (though not necessarily as an existent item) – and that it has, in that world, whatever properties it is characterized as having – that is, the characterization principle also holds without exception. I shall call theories of this sort "distributive item theories", because the main semantic work is distributed among different worlds.[1] The previously noted problems are *all* avoided (details will be laid out shortly) because there is no requirement that all the truths about the items about which we can make assumptions have to hold

[1] The name was suggested by Nancy Doubleday.

in a single world, let alone in @. The result is a genuine face-value semantics of the kind Sylvan wanted.[1] The items about which we make our assumptions have the actual properties they are characterized as having, not watered-down versions of them. Nothing has to be filtered, revised, reduced, or reconstrued so that it will fit the demanding constraints of the factual world.

How this can be done was demonstrated very elegantly by Graham Priest 2005. Priest's version of distributive item theory starts classically with an S5 model-structure to which are then added a set of impossible worlds and finally a set of open or incomplete worlds, worlds which are not closed under implication. To accommodate the needs of item theory the domain includes both existent and non-existent items. And to accommodate the needs of inconsistent and incomplete objects the interpretation function assigns to every predicate both an extension and an anti-extension in every world; the initial S5 assumption that the extension and anti-extension are exclusive and exhaustive is lifted when impossible and open worlds are added.

Two features of Priest's theory are of especial importance to us: his semantics for intentionality and his device of matrices. Propositional attitudes are expressed by two-place intentional operators, Φ, Ψ, where "$a\Phi p$" reads "a Φs that p" for some intentional verb "Φ"[2] and their semantics is handled by two-place accessibility relations on worlds. For each element d in the domain and for each intentional operator Ψ there is a relation, R^d_Ψ, between worlds. The relation $wR^d_\Psi w'$ holds iffthings in w' are as d in w Ψ's them to be, thus if "Ψ" is "fear", then "$wR^d_\Psi w'$" reads "things in w' are as d in w fears them to be", w' is the world of d's fears. In particular, therefore, if in world w (perhaps the actual world) $d\Psi p$ then there is some world w' such that $wR^d_\Psi w'$ and p is true in w'. The evaluation rules for intentional operators are:[3]

$$\mathbf{V}(d\Psi p, w) = \mathbf{T} \quad \text{iffor all } w' \text{ such that } wR^d_\Psi w', \quad \mathbf{V}(p, w') = \mathbf{T}$$
$$\mathbf{V}(d\Psi p, w) = \mathbf{F} \quad \text{iffor some } w' \text{ such that } wR^d_\Psi w', \quad \mathbf{V}(p, w') = \mathbf{F}$$

If d in w has no intentional states of any kind, or no intentional states of kind Φ, then R^d_Ψ (where Ψ is now a variable ranging over intentional operators) and R^d_Φ, respectively,

[1] See especially Sylvan 1995, reprinted in this volume, pp. 546 ff.

[2] Priest also treats objectural intentionality by homonymous *predicates*, "$a\Phi b$" reads "a Φs b", e.g. "a fears b". Intentional predicates of greater adicity are easily added.

[3] I follow Sylvan's notation here, rather than Priest's.

hold between w and every world w'. This then makes it false that $d\Psi p$ or $d\Phi p$ for any proposition p, since, in some world w', p will be false. The most basic intentional functor for Meinongian purposes, which can act as a default in our present investigations, is "d supposes that p" or in Meinongian terms "d assumes that p".

Matrices are needed in order to handle the wildness of the realm of assumption. Matrices are essentially special predicates which can be derived from sentences by replacing each *occurrence* of a free individual term in the sentence by a distinct variable, such that the least of the introduced variables is greater than the highest of the original bound variables according to some canonical ordering. For example, the formula $(\mathrm{P}v_1)(F(a, v_1, b) \vee (\mathrm{U}v_2)(G(a, v_2))$ becomes the matrix $(\mathrm{P}v_1)(F(v_3, v_1, v_4) \vee (\mathrm{U}v_2)(G(v_5, v_2))$. The manner in which matrices are constructed ensures that every sentence has a unique matrix. Semantically, matrices are treated like predicates and the interpretation function assigns them an extension and an anti-extension in all open worlds. The evaluation rules for matrices are as follows, where $C(x_1, \ldots, x_n)$ is a matrix and $t_1, \ldots, t_n$ are individual terms that may be substituted for the variables and $\mathbf{I}^+(C, w)$ and $\mathbf{I}^-(C, w)$ are, respectively the extension and anti-extension of C at open world w:

$$\mathbf{V}(C(t_1, \ldots, t_n), w) = \mathbf{T} \text{ iff } \langle \mathbf{I}(t_1), \ldots, \mathbf{I}(t_n) \rangle \in \mathbf{I}^+(C, w)$$
$$\mathbf{V}(C(t_1, \ldots, t_n), w) = \mathbf{F} \text{ iff } \langle \mathbf{I}(t_1), \ldots, \mathbf{I}(t_n) \rangle \in \mathbf{I}^-(C, w)$$

With matrices pretty much anything can be modelled with the right interpretation and freedom of assumption is preserved. So, too, is the unrestricted characterization postulate.

The problems for classical item theory previously outlined are *all* avoided in Priest's system. In some impossible world the weakly round square has both the property of being round and the property of being non-round. And not only that: in some impossible world the robustly round square both has and lacks the property of being round. Both predicational and sentential contradictions are allowed in appropriate worlds – as they should be by free assumption. Similarly with the relational counter-examples: in some possible world Gilles is married to Joan of Arc and she to him. There is no need to plug up or reduce relations and every relation has its converse. Finally, the status counter-examples are equally easily disposed of: there is some possible world in which the existent golden mountain exists; and an impossible world in which the possible round

square is possible. There is no need to classify status properties as non-characterizing with the unfortunate attendant suggestion that they are in some ways less than full-fledged properties. Indeed, the theory has no need for a distinction between characterizing and non-characterizing properties, the obscurity of which is a significant problem for classical item theory.

Priest's theory is certainly the sort of theory I was gesturing towards in an earlier attempt to solve the problems of classical item theory by distributing the semantic workload (Griffin 2008[1]). But I did not think of distributing it across worlds, because worlds (even incomplete worlds) are quite elaborate items. They not only have an enormous domain of items (in Priest's theory a single huge domain, comprising all entities and non-entities attends all the worlds) but are characterized by the enormous number of propositions which hold in them. But the typical scenario invoked when the words "Imagine ..." or "Suppose ..." are used is rarely anything as substantial as a world. It may amount to no more than is directly specified by the words which follow. This may be exceedingly little, especially in the case of what Sylvan (1995, p. 48; reprinted here, p. 547) called "isolated" items, the sort of items conjured up as logic examples, e.g. Russell's present king of France[2] and Meinong's golden mountain and round square. They come with no background story. We have nothing to go on here except the isolated description itself. It seems, not just unnecessary, but wrong to suppose such items are ensconced in a world. To do so invites entirely inappropriate questions about their relations to other items in the world. Is the golden mountain in Asia or South America? Is the present king of France a Bourbon or an Orleanist or neither? (These questions become more pressing if one thinks of these items as ensconced in the actual world. In fact, the particular questions mentioned here suggest that the items *are* in the actual world – entirely illegitimately.) One thinks there must be some background story that has to be supplied. But there need not. The "world" for an isolated item need consist of no more than the item itself and a few true propositions about it delivered by the characterization postulate

[1] Despite the date of publication, this is, in fact, the same paper that Priest (2005, p. 84n) cites under a different title. It was first presented at the 1998 Australasian Association for Logic meeting dedicated to Sylvan's memory at Macquarie University in Sydney. It was read at many places subsequently and finally at the "Russell v. Meinong" conference at McMaster University in 2005 as part of the centenary celebrations for Russell's theory of descriptions.

[2] The example is actually Richard Whately's (1827, p. 61), who used it for entirely different purposes and when there actually was a present king of France (although it also occurs in editions published when there wasn't). Thanks to Bernard Linsky for information on this.

from the description itself, closed (perhaps) under implication.[1] More, of course, could always be added – assumption, after all, is free – but it doesn't have to be. Moreover, even when a fuller story is supplied, it rarely approaches anything as elaborate as a world.

Accordingly, in my earlier account I did not think of locating non-existent items, whether isolated objects or the characters of elaborate realist fictions, in worlds, but in what I called "contexts of supposition". For most "ordinary", extensional, fact-stating (or purportedly fact-stating) discourse the context of supposition is the actual world. But for discourse involving fiction, the imagination, counter-factuals, modality, intensionality – anything from telling a joke to working out the consequences of a scientific model – other contexts are brought into play. In conversation people rapidly and informally work out what the appropriate context is, supplying it with just as much detail as they need for their purposes. The idea in all these cases was that contexts would contain only what was needed for the purpose at hand, each would have its own quite limited domain. Not only is the domain of the context exceptionally sparse so, too, is its description. In telling a joke of the kind that begins, "An Irishman, an Englishman and a kangaroo went into a bar ..." you do not need to know whether the bar was crowded or where it was, the context requires no more than the three protagonists, the bar, and (probably) a bar-keeper. Likewise in working out the trajectory of a body in theoretical mechanics the context supplies only the mass of the body and the forces acting upon it. It is misleading to think of these as the *world* of the joke or the *world* of the mechanics problem. That said, I can't say that I'm happy with the term "context of supposition" either. For one thing, it is ponderous. For another, it suggests there must be a supposition and thus a supposer, implying that contexts of supposition are fabrications of the mind.[2] I should have liked to use "set-up", but that had been pre-empted for not dissimilar purposes in the semantics of entailment.[3] Other options are not easy to come by and so I shall stick to "context of supposition", shortened to "context" to avoid the first objection.

The contexts of isolated logic examples represent, in my view, the extreme of exiguity among contexts. Fictional contexts, by contrast, are much fuller – at least in

[1] Compounding and iteration of operators (*if* allowed) may generate more propositions (in the absence of operator-reduction identities of the $\sim\sim\sim p = \sim p$ kind), even transfinitely many propositions if infinite iteration and infinite compounding are permitted. But the atomic base will often be minimal and the extensive superstructure entirely the result of elementary use of the formation rules.

[2] One could, indeed, develop the theory in this psychologistic way (and it would suit some philosophical inclinations), but it was not my intention to do so.

[3] Cf. Routley and Routley 1972; Routley and Meyer 1972, 1972a, 1973.

many cases.[1] The cases in which the word "world" comes most readily to mind are large-scale works of realist fiction, e.g. those of Balzac, Tolstoy or Hardy. Say-so semantics is standard for fiction: what the author says is so. And this fits well with the Meinongian model: the author characterizes the items in the novel and (CP) then ensures that they have, in the appropriate context, the properties by which they are characterized.[2] But no author can completely describe a world. As regards things that the author doesn't tell us about a fictional item – Sherlock Holmes' hat size, or how tall Anna Karenina was – the item is regarded as in that respect incomplete: for any given height, within appropriate limits,[3] it is neither true nor false that Anna Karenina was that height, though it is nonetheless true that there is *some* height that she was. While incompleteness is inevitable, it is lessened by two devices: the importation of items from the actual world into the fictional world; and by the closure of the resulting set of truths not only under entailment but under what Sylvan usefully called "material elaboration" ($EMJB_1$, p. 541 – i.e. $EMJB_2$, Vol. 2, chapter 7, §1).

Almost all fiction bulks up its ontology to some degree by importing some items – if only flora, fauna and material objects – from the actual world. But most of it (and especially realist and historical fiction) imports items of more specific consequence: cities, people, events, etc. Items don't have to be imported from the actual world, they can be imported from other fictions. For example, in each of the huge number of Holmes stories *not* written by Conan Doyle, Holmes himself is an import from w^d, the world Doyle imagined. When an item is imported from one context to another it brings with it all the properties it has in its native context, *except* those which the author who imports it explicitly or implicitly rejects. Assumption being free, the changes made can be very substantial.

The combination of native objects characterized by the author and objects imported with their own properties from other contexts, provides a fictional world with a basic stock of true propositions. These are then (typically) closed, not only under entailment,

[1] It might seem impossible to conceive a fiction as sparse as a logic example, but consider the following (quoted in its entirety) from Joanne Marlowe (2014, p. 15), "You are right as usual that I'm *always* wrong", which manages to be both at once. Poems, often overlooked in these discussions, can be similarly sparse. Haiku provides many examples.

[2] It is worth noting (since it is frequently overlooked) that the author's say-so is not absolute and is open to correction. Authors make mistakes. Flaubert famously described the colour of Madame Bovary's eyes inconsistently.

[3] The limits are set, somewhat loosely, by the conventions of realist fiction. Were Anna Karenina exceptionally tall or exceptionally short, we would expect Tolstoy to tell us.

but also under "material elaboration". This allows the reader to draw inferences about the fictional world based on geometry, physics, history, geography, engineering, etiquette, fashion, etc.; in short, any sources of information that are appropriate for the time and place in which the fiction is set.[1] A lot of the most basic stu ff of this kind supplies the reader with the information that what are being described are human beings living on the surface of a planet. But material elaboration can go well beyond these rudiments. In the case of realist fiction most of this background material is borrowed from the actual world with occasional (usually minor) variations and more frequent authorial mistakes (doublets in *Julius Caesar*, and the like). If readers are to understand the work, it is essential that they be able to make the inferences that material elaboration permits. In other genres (e.g. fantasy and science fiction) the assumptions may be very different and the author has to indicate, more or less explicitly, how things in the world of the fiction differ from the actual world – or at least to enable readers to work this out for themselves. The result, whether in realism or fantasy, is an imagined scenario having something that approaches the completeness of the actual world.[2]

Between the sparseness of a logic example and the fullness of an immense realist cycle of novels are any number of intermediate stages. Somewhere in the semantics the claims made in each of them are realized. Of course, it doesn't matter whether we call the places they are realized "worlds" or "contexts", but the former suggests a policy of plenitude (or maximalism), the latter one of minimalism. There are, however, two points which may make a difference, one concerns domains and the other the assignment of truth-values across them. Priest's semantics are fixed domain: there is a single enormous domain containing all conceivable items for all his worlds. By contrast, I envisaged each context as having its own domain containing only as many items as were needed for its purposes.[3] A maximalist (worlds) approach does not mandate a fixed domain semantics,

[1] Of course, any of these conditions may be lifted – think of steam punk! In science fiction the laws of nature may be different and in surrealist fiction even entailments may fail.

[2] Of course, as regards the fictional characters, incompleteness can never be entirely avoided. Yet the fictional world is imagined as complete – Holmes has a definite hat size, we just don't know what it is. In this the fictional world resembles the actual world, not as it is, but *as it is known*. Like Holmes, Basil Rathbone had a definite hat size but we don't know what it was. One is tempted to regard the incompleteness of both as an epistemic matter, but large debates between realists and anti-realists are to be expected on the issue.

[3] This way of putting things is loose but, I hope, not misleading. Contexts, of course, don't have purposes, they are selected by intentional agents for particular purposes of the agents'. The basic idea behind the minimalist semantics is that the context's domain should not include more items than the agent needs.

indeed either approach could be realized with either fixed or variable domain. Priest says little about the composition of his domain, but it is clear that it must contain every conceivable item. One way of cashing this out is to have an item for every possible description, where any combination of monadic sentence-frames may form a description. One may wonder whether even this is enough. For suppose two different authors, neither knowing the work of the other, describe a non-existent item in exactly the same way. There seems no reason to suppose that they are referring to the same item.

Such cases might seem to be rare, but in fact they are quite common in the case of isolated descriptions, such as those used in logic examples. It need not be supposed that "the present king of France", when used by Whately (at a time, of course, when there was no king of France), refers to the same item as "the present king of France" refers to when used by Russell. On the context approach, the two descriptions access different contexts and there is no need to suppose that they have the same items in their domains.[1] With a single domain, one might think that all isolated uses of the same description must refer to the same item, since in each use the item referred to would have the exactly same properties, namely those delivered by the (CP). By the identity of indiscernibles there would be but one isolated object referred to. But Priest allows the same item to take on different identities in different worlds: so a single present king of France in the domain can be mapped to different identities in the various contexts in which it appears (2005, pp. 43–7).[2] Alternatively, one might allow distinct present kings of France in the domain by individuating them by means of intentional properties over and above the properties supplied by (CP). Thus there could be the present king of France that Whately referred to and another that Russell referred to, each has a distinct intentional predicate by which it can be distinguished from the other.[3] But this option faces the difficulty of explaining how Russell might refer to the same isolated item on different occasions (since being referred to by Russell at t is one intentional property and being referred to by him at t' is another). Moreover, it would surely have been possible for Russell to have referred to

[1] This is not a point about time; there is no need to suppose that two authors refer to the same item even if they both use the description at the same time. The circumstance in which they are likely to refer to the same item is when the two uses occur in the same logic class or same conversation – though even that does not guarantee it: the speakers might be talking at cross-purposes.

[2] The precursor of this line in classical item theory is Castañeda's guise theory (Castañeda 1974).

[3] Sylvan seems at times to take this view, e.g. when he refers to "Meinong's round square", meaning, presumably, the one thought of by Meinong, and not a different one (cf. $EMJB_2$ this volume, pp. 8, 60, 105).

Whately's king of France, had he wanted to (perhaps just by invoking Whately's use of the description.)

Identities are needed not only to allow for the possible distinctness of items which share all their properties in different contexts, but also to allow for the possible identity of items which have different properties in different contexts. There are now many Sherlock Holmes stories not written by Conan Doyle, in which Holmes is characterized in ways inconsistent with the way in which he was characterized by Doyle. Suppose that there is such a story, by author e, in which Holmes never became a detective but turned his talents to crime and became a master criminal instead. Let us call the context of Doyle's stories w^d and that of e's novel w^e. It is important to recognize that e need not be envisaging some one very similar in character to Holmes and having the same name who does different things to Holmes in Doyle's stories. The point of e's novel is rather to show the temptations of a life of crime for Holmes himself and it is essential, if the reader is to understand the novel correctly, that they think that Holmes in w^e is identical with Holmes in w^d. On a fixed domain semantics without identities this will be impossible. With identities, however, a single element of the domain, Holmes, will be mapped to different identities in w^d and w^e.

At first sight, it seems as if the variable domain theory does not need to make use of identities over and above the objects themselves to solve this problem. Like much in the realm of assumption, identity of objects between worlds is entirely stipulative. If an author, a, stipulates that some object, b, in the domain, $D(w)$, of world w is identical to an object c in the domain $D(w')$ in a world, w', of their own assumption, then in w' it is. That is just the assumption a is making; that is how the item is being characterized in w' and that, by (CP), is how things are in w'. It does not matter how different the properties of b are in w compared to the properties of c in w'. So in w^e, Holmes (on e's say-so) is identical with Holmes in w^d, even though in w^d he is not. In order to preserve the symmetry and transitivity of identity it is necessary to treat the identity relation between b and c in a's supposition as a different relation from the one which holds, on the supposition of some other author, a^*, between, c in w' and d in a world, w^*, of a^*'s supposition. There is no reason to suppose that $b = d$ is true on anyone's supposition. This is only to be expected since there is no world, in the situation envisaged, at which both $b = c$ and $c = d$ hold. Similarly in w^e Holmes in w^e, call him h^e, is identical to h^d,

Holmes in w^d, since that is what e, who is responsible for selecting w^e, supposes. But in w^d, h^d is not identical to h^e, since Doyle made no supposition about w^e or h^e.

Nonetheless, variable domain semantics have complexities of their own. Intentional discourse in many worlds, including most importantly the actual world, will often involve items which are not in (the domain of) that world. In a standard quantified modal logic with a variable domain semantics we need an over-arching "frame domain", the union of the domains of all the individual worlds, for the quantifiers to range over (see Fitting and Mendelsohn 1998, p. 102). The frame domain makes it possible, in any world, w, to speak of items which are not in $D(w)$. In particular, intentional discourse about such items is not only accommodated in w but might also be true there, even if much extensional discourse about such objects is neither true nor false in w. Moreover, we need the frame domain for the interpretation of the quantifiers in intentional settings. For example, in sentences involving intentional predicates, e.g. "$a\Phi b$", and intentional operators, e.g. "$a\Phi F(b)$", we need to be able to replace "b" by a bound variable, thus "$(Px)(a\Phi x)$" and "$(Px)(a\Phi F(x))$". From the actual world we must be able to access, as items over which our quantifiers range (i.e. as objects of reference), all the items in every world w accessible from @ by any relation R^d_Φ, where d is any object in the domain of the actual world and Φ is any of its intentional states.

The introduction of the frame domain eliminates, it seems, many of the apparent advantages of variable domain semantics. Identity once again causes problems. Whately's present King of France and Russell's present King of France have both to be accommodated in the frame domain as do Holmes in w^d and Holmes in w^e. According to author e they are identical. But in the frame domain they must be distinct. In each Holmes world there is only one Holmes, but in a world like @ where the fictional Holmes worlds are surveyed, we need the frame domain and it must include both as distinct objects of reference. Either we need multiple Holmeses or Holmes needs multiple identities.

As far as the domains themselves are concerned there seems to be little to choose between fixed and variable domain semantics. The situation is somewhat different when we consider the assignment of truth-values within worlds, especially within the actual world @. The interpretation function, as we've seen, assigns an extension and an anti-extension at every world to each predicate. There is an apparently universal consensus among Meinongians that Sherlock Holmes belongs in the extension of the predicate "is

a detective" in the actual world. The only evident basis for this is that Doyle (in **@**) characterized him as being one in w^d. But consider now the work of author e which places him in the anti-extension of "is a detective" in w^e. Representing "Holmes is a detective" by "$D(h)$", if $\mathbf{V}(D(h), w^d) = \mathbf{T}$ establishes $\mathbf{V}(D(h), \mathbf{@}) = \mathbf{T}$ why doesn't $\mathbf{V}(D(h), w^e) = \mathbf{F}$ establish $\mathbf{V}(D(h), \mathbf{@}) = \mathbf{F}$? The answer in this case seems easy. Doyle was the originator of the Holmes stories, so his version takes precedence. One can acknowledge merit in this consideration, without being quite sure how to take it on board. One might claim that it was Doyle who created Holmes and therefore it is his supposition that determines how Holmes is in the actual world. But in what sense did Doyle create Holmes? Certainly not in the sense of bringing him into existence, for Holmes does not exist. At least, he doesn't in the actual world. And if we say Doyle brought him into existence in w^d, then it is equally true that e brought him into existence in w^e. Could we perhaps say that Doyle created Holmes as a non-existent item in **@**? Certainly not for Sylvan, who takes the authors of fictions to be describing rather than creating the fictional items which populate their stories. Besides, it is hardly clear what such a suggestion amounts to. What is it to create something which doesn't exist even after it's been created? By the same token we should not say that Doyle created world w^d with Holmes in it. For equally e created w^e and worlds don't exist any more than Holmes does.

What Doyle creates is not Holmes but a description of Holmes. But this is equally true of author e. What seems to privilege Doyle's description is its priority: e's description is in some sense parasitic upon Doyle's. We might thus treat Doyle's account as true of Holmes in the actual world and e's, where it differs from Doyle's, as false in **@**. This solution, however, hardly fits all cases. There are fictions (notably myths and legends) for which an initiating story cannot be identified, or can be identified but is lost. And even when texts can be found, it is not always the case that the earliest gets the privilege. Does Marlowe determine Faust's properties in the actual world or does Goethe? Or is it one of the several hundred other accounts of the character? It is not clear which accounts are parasitic upon which, nor, for that matter, which depend only upon common knowledge rather than an initiating story. At all events it seems that to determine which properties Faust has in **@** will involve exhaustive literary research which even then might not produce a definite outcome. Moreover, in the case of Faust, giving semantic privilege to *the* initiating text, even if it can be identified, is surely not the right choice, for the initiating text has been totally eclipsed by subsequent texts. We may not know whether

Marlowe or Goethe described Faust correctly in the actual world, but it would be bizarre to claim that it was the obscure author of some barely known fiction.[1] Nor should finding out what properties the fictional Faust has in the actual world depend upon heroic labours in literary history, it is something that should be revealed straight-forwardly (for the most part) by the relevant text. The problem is: which text is relevant? Since the question has no clear answer it is tempting to suppose that we are dealing with a plurality of items, different Faust counterparts existing in different worlds. But this also ought to be resisted. It does not respect the intentions of e, the author of the Holmes story, whose supposition is that it is *precisely* Sherlock Holmes himself who appears in w^e. Nor can we assume, as in counterpart theory, that the item in w^e which most closely resembles Holmes in w^d is his counterpart in w^e. A Holmes author might well imagine that it is brother Mycroft who takes up pipe smoking and the violin and becomes a detective, while Sherlock puts on weight and wastes his great intellect in the indolence of the Diogenes Club.

Relational properties raise further problems for the semantic assessment of claims about non-entities in the actual world. In w^d Holmes lives in London and London numbers him among its inhabitants. In @, on the theory here being considered, the first of these is true but not the second. This is no more plausible in distributive item theory than it was in classical item theory. Suppose, therefore, that in @ both of them are false. Holmes then becomes part of the anti-extension of "lived in London". This has the advantage of preserving the formal properties of "lived in" as a relation, but it ignores what seems to me to be an important difference between the way in which Sherlock Holmes did not live in London and the way in which Sir Walter Scott, another member of Priest's large domain, did not. Moreover, we need some principled way of explaining why "Holmes is a detective" is true while "Holmes lived in London" is not. It can't be just because one is relational and the other is not. For "Holmes picked up his pipe" is also relational and the theory gives no reason to think it is not true.

There are substantive problems, as well, going beyond questions of literary provenance, with supposing that Holmes is a detective in the actual world. If Holmes is a detective in @, why would I not recommend him to a friend who was looking to hire

[1] The case of Faust is complicated by the fact that the legend is based on Johann Faust, a sixteenth-century German conjuror who actually existed, and the first texts about him were actually sermons falsely attributing evil supernatural powers to him.

a detective? Suppose the actual Metropolitan Police in 1900 had drawn up a list of all private detectives in London, Sherlock Holmes would not have been on it. One might make use of the doctrine of reduced relations to claim that, since London did not include Holmes among its inhabitants (even though Holmes lived there), he was correctly left off the list. The list, one might say, was a list of London inhabitants who were detectives rather than a list of detectives who were London inhabitants – a subtle distinction, which may well have eluded Lestrade's actual counterparts at the Yard, and not a very plausible one. More plausibly, one might suppose that the list had an unexpressed, contextually supplied, restriction to existent detectives only. In which case, it would seem that the vast majority of uses of the word "detective" in 1900 came with existential-loading and it might seem odd that the few un-loaded uses should be taken as the semantic norm while the majority uses required special contextual (or pragmatic) loading. Moreover, the implication here seems to be that, behind the two lists masquerading as one, the list of all detectives and that of only existent ones, there are really two predicates, the one existentially loaded and the other existentially free.

If $\mathbf{V}(D(h), w^d) = \mathbf{T}$ gives us no reason to suppose that $\mathbf{V}(D(h), @) = \mathbf{T}$, it gives us no reason to suppose $\mathbf{V}(D(h), @) = \mathbf{F}$ either. For $\mathbf{V}(D(h), @) = \mathbf{F}$ is just as counter-intuitive as the similar result given by Russell's theory, which Sylvan deplores (*EMJB*$_2$ this volume, p. 153). The remaining option is to leave $D(h)$ truth-valueless at @, and this, I think, is the correct one. This is easy to motivate for variable domain semantics where $h \notin d(@)$, but harder to justify with a fixed domain. Which predicates, at which worlds are uninterpreted for which members of the domain? One can obviously pick and choose in a piecemeal fashion leaving uninterpreted those cases where an interpretation would lead to trouble. But what principle can one appeal to to make this distinction? The only one that suggests itself is that

(Pred) $x \notin \mathbf{I}^{\pm}(F, w)$ when x does not exist in w.

As it stands, (Pred) will not do. It is simply the Ontological Assumption resurrected. Important exceptions have to be made – obviously for "exists", but also for intentional predicates which hold of non-entities just as much as entities. These, once acknowledged, will be genuine exceptions – they do not have to be analyzed away, by quantifiers or scope distinctions, as they must in the reference theory. Moreover, again unlike the reference

theory, non-entities in @ will have properties in other worlds, though only in worlds in which they exist. As a result the theory handles intentionality (and existence) much better than the reference theory. But we still need to impose appropriate restrictions on (Pred).

Priest's distinction between predicates which entail existence (at one or more of their argument places) and those which don't is helpful here. If the predicate F is existence-entailing at the i-th place and a_i does not exist at w, then $\langle a_1, \ldots, a_i, \ldots, a_n\rangle \notin \mathbf{I}^+(F, w)$ and $\mathbf{V}(F(a_1, \ldots, a_i, \ldots, a_n), w) \neq \mathbf{T}$ (Priest 2005, p. 60). For example, Priest takes intentional predicates, e.g. "Φ" in "$a\Phi b$", to be existence-entailing in their first place but not in their second, since what is intended by an intentional predicate such "fear" need not exist while the intentional agent must. Given this distinction, the item theorist can acknowledge that truths in w about a non-entity there are possible when a term designating it occupies the i-th argument place of a predicate which is existence non-entailing at its i-th place. But if the predicate is existence-entailing at that place, we have in general the option of assigning the sentence the value **F** in w or leaving it truth-valueless. It is not entirely clear which predicates are existence-entailing. Priest cites the relations expressed by dyadic, extensional, transitive, action verbs like "kicks", "holds", "runs past" (2005, p. 59), as existence-entailing in both places, and also (more surprisingly) comparative relations like *being taller than* (p. 123). On the other hand, various logical predicates (e.g. "is possible") are existence non-entailing (p. 139). The examples do not give us much to go on, apart from raw intuition. Priest's intuitions here seem a good deal clearer and firmer than mine. The distinction between existence-entailing and existence non-entailing predicates seems to be an heir of the distinction between characterizing and non-characterizing predicates, though it cuts at different points. It is, perhaps, equally intuitive, but, so far as I can see, not markedly clearer.

For example, is "is round" existence-entailing? I find it hard to suppose so, for such straight-forwardly descriptive predicates (like "is wooden", "is a table", "is a detective") would seem to be paradigms of existence non-entailing predicates. Moreover, one would expect to find abstract (and therefore non-existent) geometrical figures in the extension of "is round" in the actual world. But if "is round" is not existence-entailing, then presumably the round square will be part of its extension in the actual world, and we find ourselves

forced into the dialethic option.[1] For if "is round" is existence non-entailing then, *a fortiori*, "is not round" will be.

Variable domain semantics, on the other hand, offer a solution to these problems. If items like the round square and Sherlock Holmes are not elements of $d(@)$ the question of whether the interpretation function assigns them to the extension or the anti-extension of "is round" or "is a detective" in @ does not arise. Holmes was not on the Metropolitan Police's list of private detectives in 1900 because he was not a private detective in @ in 1900, and this was because he was not an element of $d(@)$. By the same token, of course, he is not in the anti-extension of "is a detective" in @ either. Accordingly, neither $\mathbf{V}(D(h), @) = \mathbf{T}$ nor $\mathbf{V}(D(h), @) = \mathbf{F}$ are delivered by the semantics. Similarly, the round square is neither round nor square in @. It is not in $d(@)$ and so is not assigned to either $\mathbf{I}^{\pm}(\text{round}, @)$ or $\mathbf{I}^{\pm}(\text{square}, @)$. There is no need for the distinction between existence entailing and existence non-entailing predicates.

But there is a need for a distinction between predicates which access the frame domain and those which don't. That is, we need to distinguish predicates whose interpretation in a world assigns every member of the *frame domain* to either its extension or its anti-extension from the others. I'll call the former universally interpreted. Notable among universally interpreted predicates are intentional predicates whose second argument place may be occupied by any item in the frame domain. If $b \notin \mathbf{I}^{+}(a\Phi, w)$ then $b \in \mathbf{I}^{-}(a\Phi, w)$ and $\mathbf{V}(a\Phi b, w) = \mathbf{F}$. Intuitively, if b is not among the things a imagines then it is among those a does not imagine, and "a imagines b" is false. The same will be true of intentional predicates formed from sentences containing intentional operators, e.g. "a imagines that ... is coming". Intensional predicates, like "is possible", will also have to be universally interpreted. Intentional and intensional predicates are distinctive in any case just because their proper interpretation and the assignment of truth-values to the sentences in which they occur are already recognized to involve worlds beyond the actual world. It comes as no surprise that they must be universally interpreted. One extensional predicate that must be universally interpreted is, of course, "exists" itself (together with its cognates, like "is actual" and "is real"). It seems plausible to suppose that status predicates, along with intentional predicates, require universal interpretation.

[1] Not that this will worry Priest. He calls it the most "liberating" option (2005, p. 19). He surveys the alternatives at pp. 19–20. For impossible and open worlds, of course, extension and anti-extension cannot be exhaustive and exclusive and Priest's semantics yields a relevant logic. If exhaustion and exclusivity fail even at the actual world the resulting logic is both relevant and dialethic.

We have a choice in dealing with non-entities in a world w, like Sherlock Holmes in @, to either assign truth-values in w to ordinary, extensional, putatively fact-stating claims about them, e.g. to the claim that Holmes is a detective and lived in London in @, or not. If we take them to be truth-valued we face the problems that confronted classical item theory. It was in w^d not @ that Holmes lived in London, and if Holmes from w^d was a detective what about Holmes from w^e who was not? To solve these problems we need either multiple Holmeses (and multiple Londons) or else multiple identities for Holmes and London. In neither case is it quite straight-forwardly true in @ that Holmes lived in London. For if there are multiple Londons, then it is true in @ that Holmes lived in the London to be found in w^d, not the London in @. And if identities are involved then what is true in @ is that Holmes lived in London, but London with the identity it has in w^d, not that which it has in @. But this is surely odd. It is the truth-value of "Holmes lived in London" in @ that we are assessing, $\mathbf{V}$(Holmes lived in London, @) not $\mathbf{V}$(Holmes lived in London, w^d), which is straight-forward. Why should the former depend upon the identity of London in w^d rather than the identity it has in @?

If, on the other hand, we refuse to assign truth-values to such claims in the actual world – which I think is the right option – fixed domain semantics faces the problem of explaining which parts of the domain $\mathbf{I}$ should assign to the extension or anti-extension of a predicate in a given world. This will depend upon what items exist in the world in question. That is, it will depend not upon the nature of the predicate but upon the nature of the object, in particular on whether it is an element of $\mathbf{I}^+(\text{exists}, w)$. Items falling into the anti-extension of "exists" in w (the vast majority of the domain for most worlds) will be assigned to neither the extension nor the anti-extension of most extensional predicates in w. "Exists" is not quite the "perfectly ordinary predicate" Priest claims it to be (2005, p. 14).

This question does not arise for variable domain semantics, the items which create the problems for truth-value assignments in world w are not present in $d(w)$ to be assigned. And yet not all is plain sailing. For which items belong to the domain of a given world w? The traditional answer given in quantified modal logic is: the items which exist in w. Concerned as we've been throughout this paper by intentionality, this does not seem an unreasonable answer. And certainly the items that exist in w should be included in $d(w)$. But it ignores some of the other important concerns of item theory; for example, its ability to handle abstract objects. Though numbers are abstract objects and do not

exist in the actual world, we still want it to be true in the actual world that 4 is the square of 2. Historically (with Meinong and early Russell) a grades of existence doctrine has been invoked here – abstract objects, so it was sometimes claimed, subsist but do not exist – but present-day neo-Meinongians have little inclination to follow this route.[1] I am not persuaded that this option deserves all the scorn it has received. *Prima facie*, it does not seem unreasonable to maintain that there *is* an even prime in a sense in which there *is not* a greatest prime, but I will not defend this option here. I think one must include the class of abstract items, like numbers, as non-existent items in the domain of the actual world (and the domains of all possible worlds). And this will include impossible numbers like the greatest prime – for arithmetical statements about the greatest prime (e.g. that it is larger than 79259 or that it is divisible by 43) are straight-forwardly true or false. It might be a simple matter to accommodate abstract objects in $d(@)$, but further additions should probably be made as well. If item theory is to accommodate the operation of natural laws, it seems necessary to incorporate in $d(@)$ items (and especially states) which are never realized in the actual world. For example, the behaviour of matter at absolute zero, or the motion of masses under constellations of forces never actually encountered are the subject of appropriate, scientific, fact-stating and therefore truth-valued discourse. The states and forces such discourse requires are not abstract and do not exist. They seem, nevertheless, to be part of the domain of the actual world.

Similar problems affect the domain of fictional worlds as well. A natural consequence of say-so semantics would be that the *domain* of a fictional world is determined by the author's say-so. If this is so, then the domain of the world of *Anna Karenina* does not contain, even as non-existents, items like space stations, computers and genetically modified animals, things which simply didn't occur to Tolstoy.[2] It does contain a range of non-existent items, e.g. events (like Vronsky's proposal to Kitty) that are considered in the book but don't take place, but Tolstoy's say-so determines not only what exists in Anna's world but also what does not exist there. This seems an extremely plausible view. It allows the author of a fiction to determine not just what is actually the case in the

[1] Of course, a full-fledged mathematical Platonism will solve the same problem, but that is a distinctly non-Meinongian option.

[2] Since *Anna Karenina* is a realist novel, one might say that these things will exist in the future in Anna's world. This option is not available for such unconsidered possibilities as anti-gravity rays or the TARDIS.

world being imagined but the range of (unactualized) possibilities as well.[1] On a fixed domain semantics there is in Anna's world not just a non-existent proposal from Vronsky but a non-existent nuclear explosion as well. These two non-existent events in Anna's world have, it seems, quite different statuses, a difference which is easily captured by variable domain semantics. On fixed domain semantics one cannot draw the distinction in so straight-forward a way. Instead, one could make use of the worlds accessed by the intentional states of the novel's characters. In a world accessed by Kitty's imagination, Vronsky's proposal actually took place; while no character accessed a world in which a nuclear explosion took place. But this distinction doesn't cut at quite the right joint. So far as I remember, no character accessed a world in which Karenin committed suicide, yet Karenin's suicide was certainly a possibility in Anna's world in a way in which a nuclear explosion wasn't, it might even have been something that Tolstoy considered. And it is the worlds which Tolstoy's intentional states access which are what really matters. What *doesn't* happen but is possible in Anna's world, just like what does, depends upon his say-so and he does not have to specify it, second-hand as it were, through the intentional states of his characters. The problem for variable domain semantics is one of specifying which among the items which don't exist in world w should be included in its domain. I have as yet no clear and convincing answer.

It is not easy to decide between fixed and variable domain semantics. I don't think there is a knock-down argument against either one. The variable domain semantics I advocate here leaves "Sherlock Holmes is a detective" truth-valueless in the actual world. It has been argued, notably by Sylvan, that this is strongly counter-intuitive. But I think our misgivings about it stem simply from our familiarity with the context of supposition, w^d, the sentence evokes. In ordinary discourse we switch contexts rapidly as we speak of our hopes, fears and expectations and of the things we imagine. Within the contexts evoked by such talk, the items we refer to have the properties we ascribe to them. Some of these contexts have become publicly available as part of our culture and the context of Doyle's stories is one of these. As soon as Holmes is mentioned, our semantic assessment of what is said takes place (other things being equal) in the context w^d of Doyle's stories.

[1] "Possibility" should be understood here in a very wide sense, construed as including anything which can be considered conceivable in the world of the fiction. This could well include such standard alethic impossibilities as the round square.

A variable domain semantics can also avoid the complexities of Priest's theory of identities. But here the simplification is very much mitigated by the complexity of having many domains in the first place and, in addition, needing a frame domain as well. The frame domain will need as many items as the fixed domain semantics needs identities. But size does not matter here. What is more worrying is the overall complexity of the variable domain semantics. I think the most persuasive consideration in favour of the multiple domain theory is the one which first led me to adopt it: the intuitive feel of sparse contexts with small domains for so many of the purposes for which we need item theory. While it may seem appropriate to think of the contexts that Balzac or Trollope describe as worlds, it seems weird to do so of the contexts needed for a logic example, a joke, or a haiku. It just seems counter-intuitive to equip those with a full domain. Sometimes even noneists may share Quine's preference for sparse landscapes.

The problems involved in creating a really satisfactory semantics for intentionality are enormous – far greater than reference theorists and modalists have acknowledged – and we are still close to the beginning of this task. Sylvan made an enormous contribution to it in *EMJB*, but I think it is overwhelmingly clear that we need to go further than he did and that some form of distributive item theory is the solution. Quite what form the resulting theory will take is not yet clear.[1]

[1] It will be apparent how much I owe to the writings of Richard Sylvan and Graham Priest. But I owe a great deal to their conversation and correspondence as well. Priest was kind enough to send me ahead of publication the new material to be included in the much expanded second edition of *Towards Non-Being*, unfortunately my work on this paper was already too far advanced for me to take much account of it. I am grateful to the students in my graduate seminar on Sylvan's book, especially to Bradley Shubert who helped me stop worrying about the feasibility of a variable domain semantics and about the threat of psychologism.

References

$EMJB_1$ Routley, R., *Exploring Meinong's Jungle and Beyond*, Research School of Social Sciences, Australian National University, 1980.

$EMJB_2$ Routley, R. et al., *The Sylvan Jungle*, edited by M. Eckert et al., vol. 1–4, Springer Verlag, Berlin, forthcoming.

GA Meinong, Alexius, *Gesamtausgabe*, edited by R. Haller and R. Kindinger, vol. 1–8, Akademische Druck- und Verlagsanstalt, Graz, 1969–1978.

Asenjo, F. G., "La idea de un cálculo de antinomias", Seminario Matemático, Universidad Nacional de La Plata, 1954.

Castañeda, H. N., "Thinking and the structure of the world", *Philosophia* **4** (1974) 3–40.

Chisholm, Roderick, ed., *Realism and the Background of Phenomenology*, The Free Press, Glencoe, Ill., 1960.

da Costa, Newton, "Sistemas Formais Inconsistentes", Doctoral thesis, Universidade Federal do Parana, 1963.

Findlay, J. N., *Meinong's Theory of Objects and Values*, 1933.

Fitting, M. and Mendelsohn, R., *First Order Modal Logic*, Kluwer Academic Publishers, Dordrecht, 1998.

Griffin, Nicholas, "Rethinking item theory", in *Russell vs Meinong. The Legacy of "On Denoting"*, edited with Dale Jacquette, London, New York, Routledge, 2008, 204–32.

Jorgensen, Andrew Kenneth, "Types of negation in logical reconstructions of Meinong", *Grazer Philosophische Studien* **67** (2004) 21–36.

Kosok, Michael, "The formalization of Hegel's dialectical logic", in *Hegel: A Collection of Critical Essays*, edited by A. MacIntyre, Garden City, NY, Doubleday, 1972.

Lachterman, David R., "Hegel and the formalization of logic", 1980. Typescript, later published in *Graduate Faculty Philosophy Journal* **12** (1987) 153–235 (New School of Social Research).

Mally, Ernst, "Untersuchungen zur Gegenstandstheorie des Messens", in *Untersuchungen zur Gegenstandstheorie und Psychologie*, edited by A. Meinong, Leipzig, Barth, 1904, 121–262.

Marlowe, Joanne, *Randoms*, Strangegirl Publications, Hamilton, Ont., 2014.

Meinong, Alexius, "The theory of objects" (1904). translated by I. Levi, D. B. Terrell, and R. M. Chisholm in Chisholm 1960, 76–117.

Meinong, Alexius, ed., *Untersuchungen zur Gegenstandstheorie und Psychologie*, Barth, Leipzig, 1904a.

Meinong, Alexius, *Über die Stellung im System der Wissenschaften*, Voigtländer, Leipzig, 1907.

Meinong, Alexius, *On Assumptions*, 1910. (2nd edn.; 1st edn. 1902), translated by James Heanue, University of California Press, Berkeley, Calif., 1983.

Meinong, Alexius, *Über Möglichkeit und Wahrscheinlichkeit*, Barth, Leipzig, 1915. = GA 6.

Meinong, Alexius, *On Emotional Presentation*, 1917. Translated by Marie-Luise Schubert Kalsi, North Western University Press, Evanston, 1972.

Parsons, Terence, "Nuclear and extranuclear properties, Meinong and Leibniz", *Nous* **12** (1978) 137–51.

Parsons, Terence, *Nonexistent Objects*, Yale University Press, New Haven, Conn., 1980.

Pears, David, *Bertrand Russell and the British Tradition in Philosophy*, Fontana, London, 1967.

Priest, Graham, "The logic of paradox", *Journal of Philosophical Logic* **8** (1979) 220–41.

Priest, Graham, *Towards Non-Being. The Logic and Metaphysics of Intentionality*, Oxford University Press, Oxford, 2005. 2nd edn. much expanded, 2016.

Routley, R., "Some things do not exist", *Notre Dame Journal of Formal Logic* **7** (1966) 251–76.

Routley, R., "Exploring Meinong's jungle", unpublished typescript, Sylvan Papers, Fryer Library, University of Queensland, c.1967. (So dated by Sylvan on the first sheet).

Routley, R., "Existence and identity when times change. Existence is existence now", unpublished typescript, Sylvan Papers, Fryer Library, University of Queensland, 1968.

Routley, R., "Existence and identity in quantified modal logics", *Notre Dame Journal of Formal Logic* **10** (1969) 113–49.

Routley, R., "Non-existence does not exist", *Notre Dame Journal of Formal Logic* **11** (1970) 289–320.

Routley, Richard and Meyer, Robert K., "The semantics of entailment, II", *Journal of Philosophical Logic* **1** (1972) 53–73.

Routley, Richard and Meyer, Robert K., "The semantics of entailment, III", *Journal of Philosophical Logic* **1** (1972a) 192–208.

Routley, Richard and Meyer, Robert K., "The semantics of entailment, I", in *Truth, Syntax and Modality*, edited by H. Leblanc, Amsterdam, North-Holland, 1973, 199–243.

Routley, Richard and Meyer, Robert K., "Dialectical logic, classical logic and the consistency of the world", *Studies in Soviet Thought* **16** (1976) 1–25.

Routley, Richard and Routley, Val, "Semantics of first-degree entailment", *Nous* **6** (1972) 335–58.

Routley, Richard and Routley, Val, "Rehabilitating Meinong's theory of objects", *Revue Internationale de Philosophie* **27** (1973) 224–54.

Routley, Richard and Routley, Val, "The role of inconsistent and incomplete theories in the logic of belief", *Communication and Cognition* **8** (1975) 185–235.

Russell, Bertrand, "Meinong's theory of complexes and assumptions" (1904). In Russell 1994, 432–74.

Russell, Bertrand, "On denoting" (1905). In Russell 1994, 415–27.

Russell, Bertrand, "Review of Meinong 1904a" (1905a). In Russell 1994, 596–604.

Russell, Bertrand, "Review of Meinong 1907" (1907). In Russell 2014, 689–92.

Russell, Bertrand, *The Collected Papers of Bertrand Russell,* vol. 4*, Foundations of Logic 1903–05*, edited by Alasdair Urquhart, Routledge, London, 1994.

Russell, Bertrand, *The Collected Papers of Bertrand Russell,* vol. 5*, Toward "Principia Mathematica" 1905–08*, edited by G. H. Moore, Routledge, London, 2014.

Russell, Gillian, "Could there be *no* logic?", paper presented at the Society for Exact Philosophy annual meeting, McMaster University, 2015.

Swanson, Carolyn, *Reburial of Nonexistents. Reconsidering the Russell–Meinong Debate*, Rodopi, Amsterdam, 2011.

Sylvan, Richard, "Re-exploring item theory. Object theory liberalized, pluralized and simplified but comprehensivized", *Grazer Philosophische Studien* **50** (1995) 47–85. Reprinted in this volume.

Thagard, Paul, "Hegel, science and set theory", *Erkenntnis* **18** (1982) 397–410.

Whately, Richard, *The Elements of Logic*, 2nd edn., Mawman, London, 1827.

Woods, John, "Fictionality, and the logic of relations", *Southern Journal of Philosophy* **7** (1969) 51–63.

Woods, John, *The Logic of Fiction*, Mouton, The Hague, 1974.

Re-exploring item theory: Object-theory liberalized, pluralized and simplified but comprehensivized

Richard Sylvan[α]

Outside a small but expanding circle, Meinong remains an underrated philosopher, a philosopher who has not yet been given his proper due for his contributions, above all in general object-theory. One reason is that the broad philosophical position that Meinong eventually reached, after painstakingly careful work, stood in destructive contrast both to the former European mainstream and to the now dominant Anglo-American stream. What Meinong arrived at had the potential to subvert prevailing philosophy. It represented a revolutionary direction, not only in metaphysics (through object-theory) but also in other philosophical reaches such as value theory. But the revolutionary impact has so far been suppressed, with only a few features absorbed. Meinong was then an intellectual revolutionary in 20th century philosophy – admittedly an unconscious revolutionary – in a way that other Austrian philosophers of prominence, such as Brentano, Wittgenstein and Popper were not. Meinong's revolution has yet to happen. Meinong's own enterprise and practice hardly prepared the way.

Although he made major and revolutionary moves – advancing object-theory in particular far beyond anything it had previously achieved – Meinong did not present anything approaching a full, coherent and well-rounded position, an alternative capable of displacing orthodoxy. Rather much of his theory is obscure and fragmentary, decidedly incomplete with many issues unresolved, and too much borrowed from a defective past. Nor perhaps would he have claimed otherwise. In part he was gradually overcoming orthodox impositions and hang-ups in his own thinking, in part he was groping his way towards new theories he only glimpsed.

[α] Originally published in *Grazer Philosophische Studien* **50** (1995) 47-85. —*Eds.*

From a revolutionary perspective, these are not the only problems. Most serious, Meinong directed object-theory in a wrong direction, into a virtual dead-end from which escape was hard to locate. The theory got into this trouble by focussing upon a narrow and special class of objects, pretty pure phenomenological objects, which have no other source than their descriptive presentation, bare (homeless) items such as "a blue patch", "the golden mountain" and "the round square". The trouble affects not only investigations of Meinong's school, but persists in subsequent formal theories, which do eliminate the damaging pre-logical aspects of earlier theories. There has been this unfortunate tendency to try to build the whole of object-theory by extrapolation from these otherwise sourceless isolated objects. It has been accompanied by an even more unfortunate tendency of critics of object-theory (a far larger mob than its few exponents) to suppose that they can restrict object-theory to these curiosities, but also that they can transpose features of phenomenological objects to differently sourced objects, thereby obtaining contradictions allegedly refuting object-theory.

Looking back, it is as if Meinong and his small but growing band of followers saw only a fragment of a rich regional landscape, namely a part of the old city where homeless objects loitered, which may have looked self-contained but was not. The newer extensive suburbs of theoretical science and most of the surrounding intensionally saturated countryside escaped proper attention. Yet it is the objects of structures of purer science and the items of intentional systems that offer far and away the most promising paths into wider object-theory. Granted the old city retains its quaint aspects and its tourist attractions, still it is only a small and atypical part of the life of the region.

For several reasons, there is a need to venture beyond the attractions and temptations of the old city to which Meinong guided us. The present wider venture begins with reinvestigation and transformation of earlier explorations of item theory, those developed and assembled in the Jungle Book,[1] which also had its unsatisfactory features. In particular some of the themes delineating object-theory (themes M1–M9) stand, reexploration reveals, in need of revision. But wider exploration over the last years has shown more; it has disclosed features of a much more comprehensive theory of items. So reexploration has come to include a more ambitious aim: to outline a comprehensive item-theory cov-

[1] Referred to as $EMJB_1$. That text provides detailed background to the present exercise. Please refer to it on many of the key terms used here without full explanation here: for example, *characterizing* (or *nuclear*) *predicate*, *source*, and so on.

ering the entire region, a theory that enjoys a range of virtues insufficiently exhibited in previous theories such as flexibility and comparative simplicity.

For *some* sort of object-theory not much is required (though it is already too much for the present philosophical mainstream), not much more than a domain of ineliminable objects which, although they do not exist, do have distinctive properties. As much is said in theses M2 and M3:

M2. Very many objects do not exist; and in many cases they do not exist in any way at all, or have any form of being whatsoever.

M3. Non-existent objects are constituted in one way or another, and have more or less determinate natures, and thus they have properties. In fact they have properties of a range of sorts, sometimes quite ordinary properties.

A comprehensive item-theory can be expected to offer much more in the way of themes, but just how much, and of what sort, is one of the issues to be taken up immediately.

Scene setting for comprehensive item-theory

Lastly by way of introduction, a prevalent misconception as to the present state of item-theory should be removed.[1] Let there be no mistake. Item-theory is, on the whole, as these things go, in satisfactory shape; it is in much better shape than the entrenched, ailing, referential opposition. Unlike the main opposition, item-theory is not bogged down in failed or failing reductions. It is not confronted by a sizeable list of scientifically and socially essential items it cannot decently account for or admit. Item-theory is already up and away, fit and running strong. But it could, nonetheless, be put in even better shape by relaxing former unduly restrictive approaches to the free characterisation of items.

Freedom of assumption has been advertised as a major feature of item-theory;[2] but that ambiguous freedom was underpinned and rendered feasible by a heavily qualified freedom of characterisation. Now, by a simple separation strategy, soon to be revealed,

[1] Such a misconception may also have been encouraged by some remaindering of significant object-theory texts. But the book market shows nothing directly as to the health of a theory; it shows only the direction of fickle philosophical fashions in richer countries.

[2] For instance $EMJB_1$, pp. 529–30, [i.e. $EMJB_2$, Vol. 2, chapter 6, §4.1 —*Eds.*] here authentically following Meinong.

much greater freedom of specification is also being offered. Almost anything now goes; you can have anything you want, somewhere. That freedom is a further major liberalization.

Subjects and objects and other items

The subject is everything. For

M1. Everything (viz. item) whatever, however problematic or paradoxical, is an item.

This initial item-theory thesis, while apparently near tautological, proves, as it unfolds (thereby ensnaring much discourse), highly controversial. For items include *every* thing that can be talked about, signified, designated, whatever can be a subject of discourse. Whence, seemingly,

M1a. Whatever can be selected as a subject of discourse is an item.

Thus items include many things that cannot be talked about, perhaps at all, certainly not satisfactorily, according to the sistologically censorious (unfortunately virtually all who have not maintained undisclosing silence). So included are some at least of the following often *neglected* items, *all given in broad experience*: nonexistent items, negatives, vague or variable objects, contradictory objects, diagonalization products, paradoxical items, holistic and complex objects, ineffable things, nondescript items, and so on. Included therewith are many items, of wide variety, that get neglected or are admissibly forgotten or excluded under prevailing approaches.

While the subject is everything, the topic is not ontology. Many items, most of those cited, do not exist, or have other ontic status: some are not even possible. The illiberal opinion that we can only talk, or talk sensibly, about items when certain, usually demanding, conditions are satisfied, that persistent opinion is astray and, in any case, is unenforceable. Widespread philosophical censorship should be recognized for what it is: censorship. Such often onerous, variously imagined constraints as that an item must exist, have being, be material, be consistent, be objective, be exact, are one and all unnecessary, and invariably unwarranted. There are no such restrictions upon items. No restrictive characterisation is required to delineate items. Indeed since items are all-inclusive. there will be no exclusive delineations. Every thing enters, under this *initial approach*, which takes neglected items seriously.

Consider next a complementary approach. Item-theory is partly typified by a free and direct, *face-value approach*. It takes subjects, and associated items, as they come,

initially at face value, in much the way that common-sense does. It does not look for hidden analyses, unplumbed depths, deviousness, without reason. It tries to shun, or strip away, doctrines assumed in advance, a priori, about how items are or must be, what restrictive requirements they must meet. Above all, discourse is accepted, and processed, as simple and straightforward. Subjects are taken as what they present themselves as, or are presented as, subjects of certain sorts, signifying something. Certainly not all the claims subsequently made concerning them, or on their behalf, need be accepted, as they stand, or accepted at all. But that is to proceed beyond grammatical presentation and initial introduction to, what is often entangled, characterization. (There is already here much disentangling to do, at which Meinong was expert, including signs and signifieds, subjects and items.) It is one thing to be told of a unicorn, another to start imagining what it is like, quite another to proceed on to its status, to enquire whether it exists and so forth.

Both the neglected items approach and the face value approach lend support to – what they do not enforce but leave as optional – a further item-theory thesis of the following controversial form:

M0? Every well-formed subject signifies an item,

where now by 'subject' is meant subject term or expression, a linguistic item. Naturally the converse connection fails, fairly abysmally. There are innumerably many items that are not signified by any terms[1] – though any select one can no doubt be named.

The thesis is more far-reaching than M1a which strictly only concedes itemhood to select, already certified subjects of discourse (with subjects here signifieds of linguistic subjects). Although the stronger thesis appears tempting, especially to the philosophically uninformed, it is widely regarded as naive, and is an early topic for ridicule and dismissal in introductory philosophy courses and texts. Accordingly it is hardly an astute move to require it in item-theory, unless the tactic is to discredit it. Nor is it required to obtain a well developed object-theory, where only terms signifying items may conveniently conform, not all subjects. Nonetheless, despite its bad philosophical press, thesis M0? – not insisted upon even in comprehensive item-theory – can be defended, and standard criticisms disarmed.

[1] As Cantorian arguments concerning respective sizes of classes will show.

As it happens, the thesis itself is so formulated that it does allow for exceptions, by way of the qualifying term 'well-formed'. Varying that term yields variant theses, for instance for *genuine* subjects, and more exceptions, and so on. Then no doubt under Humpty Dumptyism the theory could even be twisted into orthodoxy, with "genuine" all and only logically proper subjects. But the intention was merely to exclude ungrammatical strings and the like (should that even need doing). Ideally there are *no* other exceptions. For the semantical advantages and considerable simplicity the thesis brings get eroded through exceptions. Still let us consider some candidates often favoured as exceptions:

– nonsense subjects such as 'beer-swilling quadruplicity', 'a square-shaped idea', 'an abracadabra', which many nowadays would class as ill-formed. But alternatively, very simply, nonsense subjects signify absurd items.

– other substantival expressions which do not, for one reason or another, function as full or independent subjects. For a well-worn example consider the relic term 'sake', which used to function as an independent substantive, but is now obsolete in that role, and remains in use essentially only in a possessive role (e.g. 'for – 's sake'; see the *Oxford English Dictionary* for its interesting etymology). It is a tired counter-example to M0? that 'sake' is a genuine subject but that there are no sakes (of any sort), no item for 'sake' to signify. A dilemma appears to meet such alleged counter-examples: either the expression remains functional only in limited dependent roles, in which case it is hardly a genuine subject, or else it is genuine as in its former usage, in which case there are signifieds. For there are certainly considerations, interests, causes, and so on, of requisite sorts: sakes in the original sense. In brief, 'sake' signifies a consideration.

– nonsingular subjects, including plural subjects, such as 'men' (e.g. 'men hang around here') and quantified subjects, such as 'each number' (e.g. 'each number is even or odd') and 'nobody'. No doubt a version of M0? restricted to singular subjects is correct, but is such a restriction required – because the unqualified original yields ridiculous results? Notice that 'yields ... results'. Ridiculousness only ensues given further assumptions, with the adoption of certain inference patterns, notably those inappropriate for such quantified subjects. A prime example is particularization, $f(a) \rightarrow (Px)\ f(x)$ which does not hold for subjects such as *no one*. For no one is at home does not imply someone is at home, but rather excludes it. The *Alice* books are a rich source of entertaining

examples of inappropriate inference. When the messenger responds 'I passed nobody on the road', the king (assuming nobody was going in the same direction) illegitimately infers that the messenger walks faster than nobody, and thereupon, switching logical tack, that the messenger is extraordinarily slow. As against that the messenger could also have asserted, quite consistently, 'Nobody walks faster than I do', which would have similarly induced a different incompatible round of "ridiculous results". Taking 'nobody' and 'everyone' as admissible subjects, as in 'Nobody walks around here, everyone drives' is one thing, a straightforward face-value thing. However the logical behaviour of such subjects is another, and trickier matter. As is now appreciated, f(no item) functions logically (scoping issues, concerning complexity of f, aside) like: it is not the case that for some singular item x, $f(x)$, i.e. $\sim(Px)\ f(x)$. Of course the feature that in many settings the quantified subject functions thus does not mean that such an analysis exhausts its meaning. It does not.

Not all classes of apparent exceptions to or difficulties for M0? are so easily met. A more serious challenge appears to derive from adaptations of paradoxes of denoting, that is from

– paradoxical subjects. It is even contended that a 'result' of this sort drawn from Hilbert and Bernays, 'refutes certain versions of Meinongianism', namely any which maintain that 'all terms denote'.[1] Therewith apparently refuted is enriched item-theory, by virtue simply of thesis M0? – upon substituting what obtains for denotation, which may be status or otherwise loaded, by analogous connections for signification, which is not so loaded. However paradoxes and connected results turn upon a familiar conflation: of signification with characterisation, roughly of *that* with *what*, that an item is signified with what is signified. Put differently, in reaching these results, denotation is loaded by a requirement of *faithfulness* or the like, that a denoting term, if it denotes, denotes what it says it denotes, the item is as characterized in the denoting expression. In short M0? has been strengthened to

M0+? Every well-formed subject signifies, and signifies faithfully, an item.

The strengthening clause is what is implausible and should be rejected. For it is now sufficiently appreciated that such unqualified characterisation spells serious trouble for object theories. Even subjects like "the adjacent round square which exists", if taken as

[1] See Priest 1997, p. 1, p. 11.

faithfully denoting, yield inconsistent existents, and it is worse with trivializing denoting terms (e.g. a term that says of itself that it denotes a trivializer, or implies p for arbitrary p). It is no news at all that not every subject faithfully signifies. So it is with some paradoxical subjects, such as the following term t:

> ... in informal (natural language) terms, H & B's "paradox" is about a term of the form: the successor of the denotation of this term. Call this t. If it denotes, it denotes the successor of t, i.e. of its own denotation. It is natural, then, to suppose that it has no denotation.[1]

This effectively confuses denotation with successful denotation. Where this fails then, in item-theoretic terms, is in the main conditional: if t signifies, t signifies what it says it does, namely the successor of t. Not so. While t signifies, it does not signify what it presents itself as signifying. Faithfulness fails. Naturally for the associated achievement notion, *faithful* signification, matters are different. But those concern characterization as well as signification. Accordingly, as it only claims universal signification, M0? is in no way upset by paradoxical subjects. It advances nothing as to faithfulness or reliability, which it could hardly guarantee, as logically they are far from universal.[2]

Much of the criticism of theories of objects of Meinong and others has assumed that these theories all assume a principle of faithful signification like M0?, that every subject signifies faithfully. Such was a presupposition of Ryle's famous dismissal of Meinong (and others) as committed to 'Fido'-fido theories of meaning. However the main targets (Meinong and Carnap) were not so committed; nor certainly is item-theory. No satisfactory theory can be, on pain of triviality.

In sum, nothing is imposed so far beyond a certain minimum for subject introduction (for example, linguistic conditions for talk, which can be displaced in nonlinguistic settings, for instance by those for intensional focus). That minimum is very minimal, as an example is intended to show. Here is a new subject, Bugboo.

[1] Priest 1997, p. 7. A more formal version of this argument assumes that the successor function is entirely faithful, whence by a fixed point theorem, there is a natural number that is its own successor.

[2] Nor is the idea of nonfaithful signification new, ad hoc, or plucked from nowhere. It is not only included in many formal object theories ($EMJB_1$ for one), but is part of classical logic in the Germanic, Frege–Hilbert tradition, where subjects that did not meet strict existence, uniqueness or other conditions were (wrongly) assigned such denotations as zero, the null class, and so on. That tradition went badly astray in how extraordinarily extensive and unreliable it supposed that the nonfaithful signification was, but not in its implicit recognition of the distinction involved.

Suppose Bugboo is not an item. Then Bugboo is an item, albeit an entirely nondescript one. For whatever is not an item is thereby an item. There is thus no contrast (within the subject nexus), nothing that is not an item, including such logically strange "quantified" items as *whatever* and as *nothing* itself.

It is plain, for instance from M0? that there is simply no limit to items. Everything, whether existent or not, possible or not, objective or not, even absurd or not, is an item. Like genuine subjects, there is no limit either to their variety. They can be as large, small, complex, unstructured, dynamic, variable, vague, paradoxical, perverse, as you like, and even more so. They are not restricted to objects, in some restricted senses or other of 'object' (such as those considered in the following terminological detour) or otherwise.

Terminological detours: certain key terms in item-theory further elucidated: 1. Objects and items

There are some unfortunate associations, or unnecessary restrictions, or both, introduced through use of the word 'object'. Some of these associations are, as it happens, unproblematic. There are no longer any serious worries – except their restrictiveness – about some of the obsolete senses of 'object', for instance, those concerning items, things or statements, thrown or put in the way, obstacles or hindrances (though that no doubt is how too many philosophers still tend to view nonexistent objects). But others *are* more problematic, including various recent terminological restrictions.

Firstly, the word 'object' has obtained a bad press in some quarters because of its linkage with objects of consumption. Thus, Baudrillard produced a fashionable book on the "theory of objects", which has nothing to do with object-theory, but is about consumption and objects of consumption. Then in other philosophical places, especially Marxist and feminist literature, the term 'object' has been taken to represent something that is cold, neutral, remote, without value, as in the phrase 'a mere object'.[1] Such a usage contrasts strikingly with an older sense, where an "object" is 'something which on being

[1] Thus, for instance, Barfoot 1978: 'I see that remembering has separated me from it; that looking back at myself as an object of my memory has made everything else I saw then an object as well, so that I have lost the unity' (p. 13). Similar neutralisation penetrates some environmental literature; thus e.g. Johnson 1987: 'Were such an object [a tractor] to appear as an improbable freak of nature on an uninhabited planet, it would merely be an object which was neither harmed nor benefited by its subsequent erosion' (p. 57).

seen excites a particular emotion, as admiration, horror, disdain, amusement: a sight, spectacle, gazing-stock: formerly sometimes, an object ... of pity or relief, an afflicted person, sufferer: in colloq. use, a person or thing of pitiable or ridiculous aspect ...' (*Oxford English Dictionary: object*, 3b). To add further to confusion, *object* has recently acquired a special computing science sense, in such combinations as 'object code', 'object oriented' and so on, where it means roughly *machine* (and in any case is tied to getting down to machine language).

Yet again, 'object' has been taken to refer to something material or a substance, and object-theory linked with substance-theoretical or material accounts of the world, as opposed for instance to process theories and dynamic or immaterialist accounts. In Whitehead, for instance, an object is taken to be an item enjoying some permanence, like a substance, by contrast with items like events and processes, which may be fleeting and unrepeatable. Consider what is reported: 'Whitehead distinguishes sharply between "events" and "objects". An event is unique; by its nature it can never recur. Events, we might say, are the stuff, the particularity of Nature. "Objects", on the other hand, are what we *recognise* in Nature; its permanent features. Neither object nor event can exist in isolation; every event is of a certain character, i.e. an object has "ingressed" into it, and every object characterises some event'.[1] The ontological presuppositions built into the latter statement remove it far from any theory of items; pure objects of mathematics need not ingress in any events, etc.

Unsurprisingly, too, there are philosophers who have tried to constrict object-theory to a particular narrow, and more easily discredited, style of theory, for example, to a reductive Locke–Parsons kind of theory, with objects reduced to (or always correlated with) certain bundles of properties. As regards such restrictive practices, Fine for one, is a regular offender. Such trade practices are of course hardly peculiar to object-theory; they are convenient in "refuting" otherwise much more impervious positions, and also handy for those who wish to distance their own "novel" theory, perhaps a special case of, or mere twist upon, some historical position, from that position.

Last, and most important, the notion of *object* is linked ineluctably with objectivity. There *is* something queer about a "subjective object" that there isn't about a "subjective item". The objectivity of "object" is exploited by Nagel 1979[2] in a slick slide of

[1] Passmore 1966, pp. 341–2.
[2] See p. 207.

sense: 'The private object or sense datum view is an instance of the false objectification of what is essentially subjective.' But discernment of private items, such as pains and after-images, is not any sort of objectification; subjectivity is not thereby threatened. When items take over from objects, the often presumed and exploited opposition to subjects also vanishes away. Even if '... Cartesian analysis ... takes it as its first premiss the alienation of subject and object'[1], item-theory can include both sides of the forced duality as items. Certainly in much modern European philosophy, objects do (or are made to) contrast sharply with subjects; they are entities, out there, to be perceived and acted upon by subject. "Roughly speaking, empiricism presumes that the world falls apart into two classes of entities – 'subjects' whose principal task it is to perceive and 'objects' whose character it is to be perceived. So perception, according to the empiricists is the link between two ontologically isolated forms of substance. But then, according to Heidegger, it is impossible to show how any link could possibly connect substances so disparate, how, for example, a 'spiritual substance' could ever perceive on 'external world'".[2] Whether or not Heidegger's point carries any weight (it certainly does not if intensional relations, which provide appropriate connections, are duly admitted), nothing stops objective and subjective *items* from being interrelated. But much stands in the way of objects *being* subjects, and so, if all relations reduce to identities (as is still occasionally thought), in way of objects so relating to subjects. The deep etymological connections of *object* with objectivity, objectification, what is out there, persisting, thrown in the way, will not easily disappear: an "object" theory that properly aims to encompass subjects and subjective items is resisting a significant flow, and risks insinuating defective if unintended assumptions. By contrast, item-theory can go with the flow.

Items may be objects of consumption, but mostly they are not. They may be valuable, but very often they are not. They are not all alienated or divided sharply from subjects or persons, but include them; these creatures and characters, like minds and private thoughts, are yet more items. Furthermore, process itself and processes, occasions, events and the like, are all items, though not material ones (even if perhaps transformations of material items, and perhaps not).[3] The term 'object' is not as comprehensive as 'item'; an "object" undoubtedly has some restrictions upon it in more ordinary

[1] Levins and Lewontin 1985, p. 264.

[2] Passmore 1966, pp. 488–9.

[3] A corollary is that process theory is, like any theory of things, a branch of item theory. Conversely, all items can be represented in a generous process theory.

use; for instance, it is something "out there", sufficiently objective, it is separable, more or less, it has a certain stability, it is sufficiently public, and so on. 'Thing' is perhaps even more limited. The term 'item', though it has a tendency to slide towards the linguistic or the enumerable, avoids these problems. All things and objects are items; but the converses may not hold. Mental items which are (de facto) private and subjective may not be objects, but they are certainly items.

All words have their problems, and limitations; all are liable to corruption and degradation, especially if they gain enough popularity. The term 'object' has already taken a heavy battering. So far 'item' is in significantly better shape than 'object'; it has 2 senses as a substantive, as against 7 complex senses for 'object' and 7 or more diverse senses for 'subject' (see *Oxford English Dictionary* entries); it does not (yet) have a bundle of undesirable associations. These are among the many reasons for shifting, bit by bit, away from the term 'object' to 'item'. There are advantages, however, in holding onto the world 'object' for occasional uses. Use of the term after all helps to remove unwanted restrictions the term 'item' may suggest, e.g. again to enumerated or linguistic objects.

At least the term 'object' used to offer that sort of help. Another reason for now eschewing the term 'object' is the role it has acquired, as recently in computing science, as designating some machine-related entity or other. Ontological assumptions are at work again, but they can be dropped, in computing as elsewhere. Then too, 'object' has in its favour, occasionally, the way it can function as a verb (or in other parts of speech), e.g. one can *object* to . . . ; one can't *item* to . . . ! Use of the term 'object' also gives item-theory historical roots, roots in European philosophy – roots that are occasionally helpful, but often require some pruning or even (as when the theory is misleadingly reconstrued as within the tradition of European ontology or Austrian platonism) total extirpation.

These problems with key words generate much fuel, low efficiency fuel, for philosophy. For philosophy, though far from purely linguistic (and certainly not, one meta-step removed, merely conceptual), is heavily linguistic. (Look at how much turns upon the word 'exists', and what *it* means. Differently look at how much of Meinong's work or of recent Anglo-Celtic philosophy turn upon linguistic shuffles, linguistic distinctions and niceties.) It is bad or good news for philosophy – depending on how you look at it – that words, one distinctive sort of item, as bearers of meanings, another sort, are fickle, with

none of the immutability of substances; words are vulnerable to quite rapid erosion in sense.

To return from this first terminological detour, observe that *restrictive terminology often encourages restrictive theory*. Previous theories of items, or still more restrictively those of objects, have generally not respected the full range of data; they have typically imposed undue limitations. A first step in liberalization consists in complete liberalization of items, in removing any remaining restrictions on itemhood. Given the implicit restrictions on what counts an *object*, as just explained, this step implies partial abandonment of the term 'object', and further distancing of the theory from object-theory. Objects are but a quite proper subclass – roughly, sufficiently objective, sufficiently public, sufficiently stable items – which have typically been subject to overdemanding restrictions as to the character and type.

In explicit thesis formulation, then:

M1b. While many items are objects, it is also the case that many items are not objects.

Item discourse renders liberalizations *easier*. That first step is not however the most important liberalizing step that should be taken. That step concerns characterisation, or better *specification*, of items.

A further terminological detour: 2. Assumption and characterisation and their surrounds

The term 'assumption' carries some embarrassing senses apart from those relevant to item-theory (e.g. religious senses, office or duty undertakings, pretentiousness, arrogance, usurpation, simulation). Even where the term is relevant, it exhibits some ambiguity.[1] It can allude, for instance, either to the *introduction* of an item, or its *specification*, or what is supposed about it, its *supposition* (a load). The term 'characterisation', which ordinarily overlaps 'assumption' (and was sometimes confused with it in earlier excursions in Meinong's Jungle), may signify also what is postulated of the item, its special *axiomatisation*, which normally represents what is taken for granted of it (as distinct, for instance, from supposed, for the time being, about it, and also from what might be truly said of it).

[1] In Meinong's work the matter is made worse, by heavy, varying, and unnecessary restrictions upon what can be an assumption.

The fuller setting of "natural deduction" systems supplies almost all these elements, and thus affords a natural *model*. Such a system includes all of: introduction of items, linguistically through constants or descriptions; their specification, through definitions; their characterisation, through axioms or like schemata; and suppositions concerning them, investigated in suppositional proofs. Each of these elements meets certain conditions, perhaps of an essentially unrestrictive sort, which will be indicated as they are considered, now, in a little more detail.

Introduction and presentation: This concerns the introduction or presentation of the item. (Other notions in this orbit include offering and exhibiting, and ranging wider, submitting, suggesting, putting up, proposing and delivering.) Only some rather minimal conditions must be met; little need be assumed. Something has to be the sort of thing that can be *presented*. For example, it must have a subject expression which meets grammatical requirements for being a linguistic subject, for proper presentation in a syntactical system. It must be presentable as suitably separate (e.g. as a separate element in an argument sequence). For perceptual presentation it must be suitably isolatable from its surrounds. And so on. In short, it must meet broad conditions for being a subject (of discourse). But any thing, any item, can do this. It is a matter, should failure threaten, of fixing up the presentation.

Specification and characterization do not introduce an item as such but say what an item is *like*, what features it *itself* has.

Specification: This supplies the features which purport to specify the item in question, the putative specification. As in a manufacturers' specification of a piece of machinery, it may be given by a list of properties. As the specification normally determines *which* item is in question, has been presented, an alternative term is *determination* (an old Kantian term also used by Meinong, which has conveniently fallen into disuse in this sense). Yet other terms are *demarcation* and *definition*. The term 'specification' has the advantage, now that industry has modified both usage of the term and expectations, of not requiring completeness or exactness. A specification can, like that of a character in a novel, be appropriately loose and open-ended (a "cluster characterisation", for example, as opposed to a definition by tight necessary and sufficient conditions).

Nonetheless, though sometimes vague and incomplete, specifications must meet some (again minimal) conditions; otherwise they fail to be specifications. Whatever these

conditions are, they are very considerably less demanding than the conditions standardly put up for well-definition. Certainly, existence is not required; nor is consistency. Nor is accuracy nor reliability. Reliable specifications are some among specifications.

Characterisation: In a narrower sense, this gives those of the features of an item from a full specification that it (genuinely) has. It is the correct part of a (putative) specification. In short, characterization adds requirements of *adequacy* to specifications. Let us call narrower characterisation, which concerns automatic characterisation postulates read off description of items, *automization*. The leading idea of newer item-theory is the freeing-up of characterisation, so that it is not restricted to and need not require automization. In a wider sense, a characterisation expands to include postulates and other requirements imposed on an item. For the postulational part the terms *postulation* and *axiomatisation* will be used, despite their unwanted associations (e.g. with self-evidence in the latter case); there would be some merit in assigning a term such as *delineation* a technical sense to cover the role.

Supposition and postulation: Postulation gives what is taken for granted, in one way or another; it may be simply what is put up, or it may be what is claimed on the basis of reasoning. Supposition supplies what is supposed or hypothesized, in particular about an item. Unlike postulation, supposition is not taken for granted (for the context in question). Unlike postulation, a supposition may be dropped, discharged or modified (so differently can postulation, but that changes the theory). Likewise new suppositions are freely introduced, perhaps within the scope of standing suppositions. Supposition is always putative: postulation is not.

As the boundary between postulation and supposition is contextually dependent, the boundary is not sharp. That is one reason why the notions tend to be easily confused, and why the term *assumption*, said sometimes 'to fix what can be said or assumed about an item', vacillates between the notions. But in a formal setting, such as that of "natural deduction", the differences are clear enough.

These more than merely terminological distinctions – conceptual divisions – lead immediately into substantive issues, especially to conditions to be met for each sort of division, and for matching freedom of operation.

For each type of element there are matching *freedom* features and principles. In some cases, introduction and supposition, there is complete freedom, within categorial

confines. Anything (any item) can be introduced. Anything (any proposition) can be supposed. It is simply a matter of getting or making sure what is involved is in the right form, the relevant category. By contrast, for one at least of specification and characterisation that is not good enough. There is a trade-off, which constituted a problem for old item-theory, between freedom of specification and of narrow characterisation, more exactly between freedom of specification (any cluster of features whatsoever can specify an item) and unrestricted narrow characterisation (all the properties used to determine an item can be truly predicated of it, or more succinctly, an item has all the properties used to specify it). In the theory of logicistic systems, freedom of specification was generally abandoned. But in the old item-theory freedom of specification was maintained at the cost of freedom of characterisation; only certain predicates could automatically enter in characterisation. This has appeared to make for problems, one of them simply this: What is meant by saying that a property is part of the specification of an item if the item doesn't have the property in question? With our experience of manufactured goods, that problem is not so severe. Goods frequently fail to conform to their specifications: either the goods are defective or the specifications are unsatisfactory given the goods involved.

Freedom naturally vanishes if items to be specified or characterised are already given, as manufactured goods are. Specification and postulation then have to accommodate to given items. While specification and postulation frequently do have to accommodate to given items or preanalytic data, often they do not, and then they are free. The cost of free postulation is truth (consistency, etc.), as the cost in free specification is existence (possibility, reliability, etc.). While there is complete freedom of postulation, provided only that the basic (statemental) forms are met, there may be heavy penalties in usually prized external properties such as truthlikeness. There is no assurance that the results of postulation measure up to externally imposed standards; only worlds far removed from actual ones may be impressionistically or partially depicted.

Already indicated therewith are the two main stages of a comprehensive item-theory. Namely, first, completely free specification of items; and subsequently assessment of items as to adequacy for various purposes.

First developmental stage of comprehensive item-theory

Reencountering assumption and characterization

There is a serious limitation to object-theory as so far developed recently.[1] That limitation lies in the restriction of assumption, through certain characterisation postulates, of a carefully qualified form to the effect that objects have all their characterising features. These were (sometimes at least) taken to hold *everywhere*, when they hold only within the confines of certain formerly central settings.

Important arguments of object-theory led to the following claim:[2] *Some* characterisation principles, procedures or postulates are needed to supply nonexistent objects with their distinctive (nonintensional) features, their distinguishing and separating features. *Some* postulates or other; but no *particular* set for all types of items. It does not follow that the very specific postulates sometimes introduced into formalised object-theory are required or obligatory. These postulates usually take some such form as,

(CP) $A(\tau x A)$

with τ some descriptor, and with some heavy restrictions upon the schema A admitted, in order to avoid triviality of theory. Or as

(CPA) $F(n)$

where F is in the constitution of, or is a nuclear property of, distinguished term n. Nothing however forces postulates of these particular forms. Postulates can be *freely* chosen. But that natural proposal can introduce awkward problems.

For such postulates as those of CP form, even decently specified, can lead to trouble in the context of other (perhaps naturally-imposed) conditions and other postulates, and can appear to rule out other less demanding or differently characterised objects. In a

[1] The whole theory of items remains very much in the developmental stages. Nor have the prototype logical theories, largely bypassed in the rush of mainstream busyness, had the critical assessment and testing they deserve.

[2] Such arguments represent a main staging point on route to the item-theory of $EMJB_1$, upon which the present exercise is heavily parasitic.

generous theory, such as item-theory is intended to be, there is no reason to seek to do those exclusive things.

One typical example of the problems of exclusiveness takes these lines: Consider a prime, m, between the twin primes 11 and 13 (i.e. $m = \xi x(11 < x < 13)$ & prime x). By a suitably liberal characterisation postulate m is both prime and between 11 and 13 (i.e. prime m and $11 < m < 13$). But by standard arithmetic (and similarly by Peano arithmetic, which has no facilities for introduction of these extra items), *there are* no primes properly between 11 and 13. The outcome is a bit awkward. If we do not want push further into dialethic reaches, which is certainly not where standard arithmetic is supposed to lead, qualifications have to be inserted. For instance, we could say that while there are no standard primes between 11 and 13, there are some assumption-generated primes, which "standard" arithmetic does not yield or recognise. However, there is no impressive reason why a more pluralistic noneist framework should not recognise *all* these sorts of arithmetic (and others): standard arithmetic as neutralised, Peano arithmetic as neutralised, assumption-enriched and qualified arithmetic, dialethic arithmetic, and so on. Let's have them all, let's hear it for them all!

That major liberalisation is in effect achieved through an elementary quantifier shift. The particular-universal form, with *some* characterisation postulate applicable to *all* objects, is superseded by a universal-particular form, with for *every* sort of object, except the entirely nondescript, *some* characterisation. That characterisation will often be achieved through a postulate or assumption framework; but it can of course be attained in other familiar ways (such as a genetic account, character delineation, typical presentation, etc.) drawn from many possible sources.

As the difference resembles that between uniform convergence and ordinary (perhaps non-uniform) convergence of a sequence, let us likewise distinguish *uniform* (or rigid) and *flexible* (or not necessarily uniform) characterization. What is contrasted is

FC. For every item there is a characterization (of some sort), with
UC. There is a characterization (scheme) for every item.

In the past this distinction has been insufficiently clear; it has seemed that historical object-theories, such as Meinong's, are uniform.[1]

[1] The theory of $EMJB_1$ was explicitly criticised along these lines, which had the effect of forcefully drawing the distinction to my attention. While that theory was certainly not intended to be uniform, the

While item-theory itself was intended to be flexible, the relevant thesis M6 was, as formulated, at least somewhat ambiguous. It read:

M6. An object has those characterising properties used to characterize it.

For example, the round square, being the object characterised as round and square, is both round and square. While the first part could be (wrongly) construed as near tautological, the examples could well suggest that isolated structural characterization operates everywhere. But that is not so; it operates automatically only for certain residual objects, the objects (sometimes distinguished as M-objects) of narrow object-theories, such as the popular part of Meinong's theory and imitations and formalizations of it. (Correspondingly, a correct qualification of M6 is to M-objects, or as will be said, to *bare* objects.) Other items, other specifications.

Put differently, a major deficiency in the development of item-theory has been this. Hitherto object-theories have tended to follow the narrow lead provided by a part of Meinong's object-theory and to focus upon otherwise sourceless objects, items without much setting, whose sole "sources" are their descriptions, such as the round square, a blue thing, the present king of France, and so on – *instead* of looking also at more interesting anti-entities such as transfinite ordinals, quarks, and so forth. In such *residual* cases as bare items, where there is no other source to consult, properties of the item are directly reached internally, from the structural description. The round square, for example, by virtue of its description, is round and square. (By contrast, the existent round square is round and square and presented as existent, but does not exist. For items alone cannot determine their own status.) But the approach through such bare, otherwise sourceless items has *distorted* and limited theory, seriously underemphasizing its richness and importance, and obstructing its grander development. It is much more revealing to begin with items with rich sources such as those of intricate mathematics, challenging theoretical science, and high fiction, and to treat the originally emphasized bare objects as default cases: structural descriptions are sources in evacuated contexts when other normal sources fail.

In the light of the distinction of types of characterisation indicated, item-theory can be initially separated into two interconnected, sometimes overlapping but far from

matter was not made sufficiently clear. In particular thesis M6 of $EMJB_1$ [see $EMJB_2$, this volume, p. 3 *—Eds.*] was, as indicated in the main text, wide open to fair criticism.

exhaustive, areas: old downtown and suburban. Pictorially the ancient city coincides approximately with older object-theory, as postulationally constrained by characterisation postulates of type CP. In suburban regions such specific characterisation postulates may not apply or operate (as no such CP operates upon m in standard arithmetic). In the suburbs items are characterised or axiomatised through different postulates, appropriate to the suburb. Such characterisation is of course far from new; but it has often been put it in illegitimate existential form, such as Platonically-inspired "existence axioms". In structures of items given by postulation, neither are items being brought into existence (or assigned being), nor are the items concerned constructed (except in special cases where recipes or the like for generation may be offered). Neither a creationist nor a constructive story is being told, or would be satisfactory. Rather what occurs is, as in astronomy, selection of items, from a vast background of items, selection of certain items for investigation.

What is intended includes a vast expansion of postulate theory, as that topic is explained in stock logical texts.[1] While stock postulate theory is based on some form of classical logic, such as second order theory, in fact *any* logical basis may serve. As well, far less formal arrangements may operate.

The division into various regions relates then to access through free assumption, and concerns the structures and types of specification involved, postulation or other. While these may be, as in ancient structures, object-characterisation postulates (of a regimented form), the postulates can be of any sort. As such assumption is free and unlimited, *any* batch of postulates or the like is admissible. Liberalization begins by suburbanisation!

In suburban regions, of which there are really no end of varieties, specific delineating principles or axioms are imposed on the items involved. These axioms may *amount* to special cases of the characterisation postulate, as happens with the main axioms of set theory and of attribute theory. But they need not. In special areas – such as those of arithmetic, analysis, this or that space or topology – properties and relations of items (numbers, spaces, categories, etc.) are assigned by sets of postulates, type-of-object-specific assumptions. These postulational assumptions *displace* characterisation postulates. The items are those that satisfy the characterisation through the given pos-

[1] Notably Church 1956, p. 317ff. A comparison of Church on postulate theory with Meinong on assumption theory would prove rewarding.

tulates, those which have the features so assigned. (So each is a *that which*, as some philosophers like to express it: but *that whichery* does not in general guarantee existence, or even ensure consistency.) To be sure, as is worth emphasizing, an overarching and unifying characterisation postulate does then operate; namely, to the effect that the items so postulationally-characterised conform to the postulates, i.e. that which satisfies the postulates satisfies the postulates, a sort of *meta-* or better *epi-CP* (ECP). In other words, in the liberated theory only a more overarching version of the CP will hold good at best, namely a regionalised epi-principle taking the following shape: the items of the region (or the theory depicting it) have the features their assumptive principles ascribe.

Examples of suburban zones are provided by an extraordinarily wide range of theories: not only by most mathematical theories (subsequently duly neutralized), by philosophical theories as those of monads, of substances (perhaps already in postulate form, as in Spinoza), or of gods, by theories of ideal objects, including those of physics, biology and economics, and by theories of religious and philosophical items such as Soul, Self, Will, Virtue, Tao, Nirvana, Absolute, etc., but also through theories of what are presently regarded as unusual objects – such as variable objects, generic items, dynamic objects, processes, vague objects, characterless objects, etc. Item-theory as a comprehensive theory of items can be seen as an umbrella theory of the items of the theories under its umbrella, with central theory at the centre and suburban theories radiating out. Other pictures serve in turn to cancel limitations of the umbrella image; for instance that of item-theory as like a mapping department which surveys and generally maps out a whole landscape.

As in more site-constrained terrestial suburbs, there are both *isolated* individual structures and enterprises, and group projects and developments, including *integrated* estates. In such group developments, distinctive constraints may apply across whole estate, constraints not upset by different conditions upon other estates with different postcodes. So it is with postulates; these may be uniform across an extensive system, but not apply elsewhere; they are so to say endemic to that systematization.

Expanded specification

The liberalized theory so far sketched is still too narrow. For many structures discerned may violate theory-requirements, may be nonsymbolic, etc. While in fictionalization,

symbolic representative prevails, in much artistic work presentation operates differently, e.g. pictorially. Put differently, the approach so far taken may be justly criticised as over-intellectual, at least so far as it has focussed on access to items through theories by predominantly intellectual means, such as explicit or implicit postulation and the like. Intellectualization is but part of intensionalisation. Access to nonexistent items is also accomplished by various other very familiar means: in particular, experiential means, such as dreams, memory, perception, and imagination, as well as intellectual means, such as assumption and inference. Creature *access* beyond the creature, to outsides, to other worlds, to objects (from subjects), is achieved by intensional relations. The empiricist prototype, perception, is just *one* of these relations. A more general picture involves, at first schematisation, a subject standing in a direct intensional relation to objects or items (observe that reverse connections are important also, e.g. for emotional phenomena). Items so intensionally discerned are intentionally specified. The specification of a perceived object is in terms of the features the object is perceived to have. In the world of that perception, it can have all the features so specified. It may well be that the item involved cannot actually have all the features thus ascribed. Actual worlds properly resist intentional prescription. The important point for present purposes is that nonintellectually discerned items are intensionally characterised; and such characterisation reaches beyond postulation as usually understood. It is even more implicit and less linguistic. This brings us then to the extensive, often *unintellectualised*, rural and wider regions of item-theory. Partly because of these regions, nondowntown item-theory does not dissipate into an expansive and windy postulate-theory. For instance, an existentially-neutralised nonclassically-based postulate-theory constitutes only part of item-theory.

The huge suburban and rural reaches of item-theory consist then of *characterisation-relaxed* structures and landforms, where narrow characterisation postulates, uniform automatization, get displaced. There is *no* limit upon the variety or types of items admitted, or which can be considered. But nor are there limits to the "assumptions" admitted; that too is entirely free. Any old axiomatic or intentionally-supplied constraints are allowed; among untoward results will be that some special structures of items are trivial.[1] Such triviality does not matter; it is to be expected, and the diagnosed structures will be set aside as no longer so interesting. Nor does that triviality spread or

[1] Such is the fate of several grander philosophical structures, so it is argued in Priest et al. 1989, where it is also contended that many such structures are inconsistent.

infect the rest of the broad theory. Triviality of one outlying structure does not burst out and sink the rest; triviality is well-contained. Nothing requires that such theories are consistent or regular; trivial worlds simply are very far from actual.

Nothing stops mixing of central and suburban structures, as opponents of item-theory have in concerted attempts to bring the whole grand city complex down. The suburbs are not neatly segregated. The result of such mixing will of course be structures *different* from the starting special structures; for instance, arithmetics much richer than Peano's; and outcomes will often enough be in trouble. But that's alright. Some items are troublemakers, paradoxical, difficult or wayward. Correspondingly, some theories of types of items are troublesome; some theories are too rich; some are trivial. The more important present point is that suburban zones do not *also* have to conform to narrow characterization assumptions – unless it is so specified, in which case this is a further local feature (and perhaps a trivialising one). Usually mixed theories will furnish yet further, perhaps exotic, suburbs.

In old downtown areas a restricted characterisation postulate is satisfied – some postulate – for the restrictions may be subject to variations. In *default* of a special postulate or assumption framework, contextually signalled, some general characterisation principle will operate, i.e. a principle of the form $A(\tau x A)$, subject to *some* satisfactory constraints. Since central theory tends, especially where natural language and common-sense are concerned, to operate by default, the constraints are usually not specified or even well indicated. But we now know from investigations of object-theory some of the sorts of constraints that are satisfactory when adequacy is sought (e.g. again to nuclear predicates). Most of that investigation has been directed at central theorizing. Special subjects, especially branches of ideal sciences such as logic and mathematics, concentrate on suburban areas (special zones specialists depart to their suburban offices during their working hours). Natural languages (conceived as theories) form part of central theory. They do not underwrite unrestricted characterisation postulates, but presuppose "natural" constraints. So natural languages are *not* potentially trivial on this score (what da Costa n.d. alleges).[1]

The diversification of regions (and correspondingly of theories) under the broader item umbrella is to be expected. The broad theory of all items is not going to be exhausted

[1] See further the appendix.

in a single theory with one fixed set of postulates. Wherever characterising postulates are adopted, other forms and styles of postulation are available and can in principle be tried. (For these sorts of reasons, the claim to generality of the old item-theory was misleading. It suggested a kind of comprehensiveness which is not available.)

One remaining issue of moment concerns *integration of regions*. Two different images other than the city region may also help, to begin. A first is that of a modern large mosaic telescope. Such a telescope has a mosaic of small mirrors each of which is figured to form part of the surface of a single large mirror. By this means a much improved overall picture of distant objects can be achieved. Item-theory, with its mosaic of regions (and semantically of worlds) has an analogous aim. A second related image is that of a cubist painting, a Braque painting for example, which combines in one frame many smaller scenes. Again the aim is improved overall representation. But the images are only images. The fitting together in pluralistic item-theory is achieved, not by spatial location (though such a depiction has a qualified usefulness as regards the system of worlds and their access relations involved in an accurate semantical story), but through *contextual location*, location contextually supplied. As in pluralism, contextualisation plays a crucial role; a theory has a contextually supplied address, its postcode or source-code. It could even be said that a principle of contextual characterization applies: that is, which specification principles operate is contextually given or ascertainable.

Naturally a suburban theory such as a nonstandard arithmetic, or a country story, such as *Pickwick Papers*, can be discussed in a linguistically absolute fashion, where a background context is taken for granted. For integration into the larger theory, however, the background context of a regional theory is often taken up in one way or another (e.g. *non*Archimedean arithmetic, Dickens' Sam Weller or Pickwickian Sam Weller), or by way of covering functor (e.g. in Peano arithmetic, as related in the Bible). It is suitable contextual addressing, taken into significations, that affords location in the larger theoretical framework.[1]

Properly addressed theories are readily integrated into the item-theory geography or mosaics. Semantics for each properly addressed theory is supplied through a system of worlds. By virtue of the separation achieved by contextual addressing, these systems can be combined to form a super-system of worlds, a further system of worlds which affords

[1] For a full account of taking up context see SL.

an accurate representation of the mosaic integration of theories. But semantical matters do not end there (with neutralisation of what is now a fairly standard intensional view).

At this stage some techno-logical development could be infused. What the comprehensive theory includes are *zones* of *structures* of *items*, with *codes* or addresses of zones and structures of distinguished areas within those zones supplied, So much resembles what might be depicted on a detailed map of a region. Associated with structures are *sources* which provide *specifications* of the items of the structures. No doubt too the items distinguished so far, and those to come, can be assembled together in a relational structure, a complex array, giving a sort of formal representation of the theory. A suitable structure would include domains or functions supplying at least all the items just given italicized mention.

Processing, for adequacy, to meet actuality and factuality constraints

Pluralization: from theoretical to radical

The direction of liberation amounts to that of pluralization, of which there are two stages, first of theories, structures and associated worlds, and secondly, a more radical liberalization still to come, of truth and correctness and correspondingly of actuality and factuality. Firstly, in place of a single theory arises a plurality of theories, in place of a uniform city centre a mosaic of regions; therewith the already rich variety of objects and items is further enhanced.

Many introductions and presentations, presumptions and postulations, while propositional in character, do not make status claims, to factuality, truth, objectivity or the like. They only make, or are only entitled to make, *what costs little*, other worldly or other situation claims, as to what *holds* there, in the country, etc. (The cost lies in what it costs to demarcate a situation or world fragment) So it is with many of range of introductory preambles such as 'Let', 'Let it be granted that', 'Given', 'Once upon a time', 'In a faraway world', 'Imagine', 'Define such and such as'. Outside pure science, not much in the way of status is expected upon following through such preambles; primarily

in mathematics, which often illegitimately elevates its ideal items (surrogates for actual objects) to existence, more is regularly contemplated.[1]

Nonetheless, it is often important, and sometimes essential, to be able to report on what holds of items not merely in other worlds, but in actual worlds too (and in logically regular worlds). For instance, Pegasus is a winged horse but does not exist, $7 + 5$ does equal 12, not 2, Sherlock Holmes was a detective who lived in London, Moas are not the same as, but bigger than, Phoenixes, and so on. For these and interlaced assignments, items and sometimes whole structures of objects are transferred, after processing, when duly prepared, to more central evaluation areas.

Often processing is never undertaken. For instance, theories remain mere speculation, and never get further assessed. What happens in processing can be variously told, for example, in terms of tales of address upgrading or regional transfer to city locations on a theory level, or in terms of transworld travel or commerce at a semantical level. Such a theory as first order arithmetic may require little or no preparation to transfer to a respectable city address (not so perhaps a richer arithmetic which could formally represent its own semantics). By contrast, features of the life of Joan of Arc's unhappy husband (drawn from Griffin's novelette$^{\alpha}$) require preparation before Joan's-husband gets housed downtown, at least where awkward clashes with Joan's lifelong spinsterhood are to be avoided. A typical preparation would be "reduction" of these relations that Joan's-husband entered in the novelette, so that conditions for application of a central CP were satisfied.[2]

Even a religious analogy may help. In certain religions, people live out their lives, then they answer to a Maker on how well they have done. Similarly items do their itemizing out in suburbs or countryside, but eventually they may answer to factuality tribunals, as regards how adequately they have done.

[1] The option of treating whole of mathematics as delivering falsehoods, not usually taken by philosophers, could help support literary people rather than scientists.

[α] Sylvan himself was responsible for the example of Joan of Arc's husband as a problem for item theory, see $EMJB_2$, this volume, p. 348. Griffin reports that the reference to "Griffin's novelette" was "Richard's joke about my attempt to provide a back story for the example by supposing that Shaw had written, not Saint Joan, but Mrs D'Arc, in which Joan was a Victorian bluestocking ahead of her time, married to the fifteenth-century equivalent of an ineffectual Oxbridge don with a passing resemblance to Gilbert Murray. I must have mentioned this to him in correspondence or conversation, but perhaps with different details. The back story got more elaborate (and more Shavian!) with each retelling." —*Eds.*

[2] For explanation of reduced relations, see $EMJB_1$, pp. 268–9 [i.e. $EMJB_2$, this volume, p. 350 —*Eds.*].

Put differently, out in its region, an item has all those features, properties and relations, it is ascribed by its relevant source. If its source reliably says it is thus and so, then it is thus and so. Like what is told in a story, believed in a religion, or explained within science, this may comprise a bizarre or unlikely collection of features, a logically intractable collection even on received perceptions. Down, however, where truth is evaluated, as in an actual world, affairs are different, and more demanding, as (real-world) constraints operate. For example, what Lytton has told on the destruction of Pompeii in The Last Days of Pompeii is one depiction, and long received; what archaeological investigations are now disclosing about the city, and the character of the resident population, is a different matter, which as far as truth goes, as opposed to literary merit, enjoys some priority. While there is mostly not a strong temptation to assign truth, factuality, authenticity, and so on, to the meanderings of story-tellers or even philosophers, what needs tempering is widespread proclivity to assign undue credence to the pronouncement and speculations of priests and scientists and various other experts and crackpots.

Preparation of an item (or system of items) for factual inclusion – which strictly involves two separable parts, inclusion of the item in an actual world domain, and assignment of non-compound features – is not unique. It should no longer be a material objection that there is a touch of indeterminacy and some arbitrariness in how an item is prepared where it needs to be. There are alternatives as there are alternative actual worlds; there are better and worse and indifferent options. Classical logical approaches, themselves not unique, are decidedly worse.[1] Consider, for another example, a leading character N in Lytton 1850's work. If she existed then she has a rich array of features, namely those portrayed by Lytton given his picture is accurate. But if, by chance, she did not exist, her primary features plummet to zero classically. And if her past existence should remain uncertain, then she hovers uncertainly, for all that ordinarily discourse may operate similarly whatever the situation, between richness and nothing.

One way that preparation may proceed in the transfer from country to evaluation market, consists in deletion or reduction of non-characterizing (or non-primary) features and compensating adjustment of deleted or reduced features to presentational features. For instance, an item Doddy, a dodo, that is portrayed as existing in Mauritius in Prof. Somersault's work, a bird which Somersault takes to be as real as quarks, is reassigned presentational existence when entered in the domain of an accommodating

[1] As is explained in enough detail in $EMJB_1$.

actual world. *Regularization* or *normalization* of features, data and so on, is in fact commonplace in scientific practice; awkward or wayward data get deleted, functions are smoothed or normalized, and so on.[1]

For a more detailed example, consider preparation of *constructive set theory*, as axiomatised by way of modification of Zermelo's theory.[2] Even when Zermelo's theory is made more plausible through some sort of constructive explication, there remain two types of impediments to its elevation to factuality or truth status – certainty given common-sense or item-theory.

Consider *first*, the fashionable existential claims made concerning its sets, none of which are to be encountered in an everyday empirical world. (For example, ordinary collections, clubs or whatever, are not invariant, but can change their elements over time without sacrificing their identity.) Its sets are ideal objects, which do not exist, so why endorse the grand existential claims which the theory advances, especially concerning a range of transfinite objects nowhere to be grounded satisfactorily in existential experience or confirmed in a physical world. There seem to be no actual objects like transfinite constructive sets. To compound evident enough difficulties, all the sets of pure constructive set theory are taken to be constructed, by admissible theoretic operations (such as union and complementation, powering, etc.), out of the null set $\{\}$, out of *nothing*, so almost to say.

In a way, the great sistological beauty of constructive set theory is that, in its quintessentially pure form, it builds a huge structure out of the null set – and so out of what is often seen, from a existential viewpoint, as highly problematic. Out of nothing but a single set of nothing – or no members – a huge structure results (of course it could result from any object). The null set does not exist, according to ordinary unwarped perceptions (hence its effective removal from the calculus of individuals). So how could the rest exist either?

A *second* major impediment connects with the first through the null set. Owing to its classical logical basis, paradoxes of implication and inference are transmitted to the set theory. Some of these concern the null set. For example, by virtue of the paradox that

[1] There is now a small literature discussing this scientific preparation, especially in the context of scientific fraud. See e.g. Broad and Wade 1983, or Franklin 1984.

[2] For requisite details of the standard model for Zermelo–Fraenkel set theory, see almost any post-l970 textbook covering set theory, e.g. Fraenkel, Bar-Hillel and Levy 1973 or Schoenfield 1967.

a false statement implies anything, it follows fairly directly that the null set is included in every set. Every set shares a "common inclusion", namely the null set. Similarly, likewise counterintuitively, there is a single null set.

Preparation is, like main impediments, two-fold: neutralization of existential claims, and qualifications of claims made to those for cc (classical constructive) sets, or *ccets* if preferred. Instead of "there exists a single set which is included in every set, namely the null set" it is said in the prepared statement that some cc set is (cc)included in every cc set, namely the null cc set.

A second example involves more. Historically important now is treatment and evaluative preparation of structures of bare objects, such as Meinong and other phenomenologists considered. What initial unprepared structures of the sort are like will depend upon what objects, what *sort* of problematic objects, they include. Before Meinong, considered structures were normally restricted to fairly well-behaved possible objects; these usually required little preparation other than ontic neutralization. (Even so there were exceptions in the vicinity of the Ontological argument: the most beautiful existent island, and so on.) With Meinong the range of objects investigated vastly expanded: both inconsistent and radically incomplete objects (such as something blue) were incorporated. Still the structures remained coherent, with apparent inconsistencies such as the roundness and squareness of the round square (derived from an assumed CP) nicely controlled.[1] Heavy opposition to object-theory soon led to the introduction of more difficult structures – also supposed to be actual world structures – first comprising objects whose features contradicted what was already taken as unquestionably given, such as that there are no existent round squares, and secondly comprising objects which lead to breakdown, explosion or even triviality of structures.

Liberalized item-theory simply admits all these structures, at appropriate addresses, conceding the now evident, that some are radically flawed structures. Because of remote (nonactual) addresses, objects cannot generate non-conservative extensions of what is actual, such as new existent things, or new relations between them. An existent God in a structure at a Vatican address, will exist at that address, but does not thereby exist; similarly for fictional objects, the Red Queen will exist at whatever the address of

[1] In one way or another either through predicate negation theory or paraconsistent logic. Strictly there are *different* structures resulting, depending upon how an inexplicit informal base is logically elaborated.

the *Alice* Books is, but address-relative existence does not entail existence. Similarly for (other) items and relations.

Preparation of bare objects structures for actual-world-inclusion is not unique; there is a plurality of related ways of proceeding, different ways brought out by different classifications and different formal object-theories. For example, one way is given by Parsons' theory of nonexistent objects, main ingredients of which comprise, as regards predicates in structure descriptions, watering-down of nonnuclear one-place predicates (nuclear predicates stand) and bracketing of two or more place predicates (effectively reducing relations).[1] Other viable formal object-theories employ related, and sometimes interdefinable, procedures. As all those can be admitted in comprehensive item-theory, *it* includes logical space for the structures and regularization and normalization procedures of other object-theories. Nothing viable need be excluded.

For yet other examples, consider ideal mathematical objects characterised by, postulation, for example Peano numbers, Hilbertian geometric lines and points, vector spaces, or whatever. Then these objects are characterised by the specified postulation procedure. It is inadmissible to throw on top of them further items with a structural descriptive characterizations drawn from elsewhere. No doubt some further structures including these items as well, can be developed, but it is *different*. Preparation of such a postulate characterised zone may consist in nothing more than neutralizing existential assumptions, if the objects are suitably isolated. If however they are related to independently characterised objects, some reduction of relations may also be needed. This includes suspension of logical relations, such as active-passive transformation. It may also include replacement of nonspecifying status-determining features by presentational or diluted analogues. Such preparation should, incidentally, deliver qualified faithfulness. Observe however that preparation is not always feasible, because a structure may be too degenerate.

Freedom of characterisation is not qualified, or defeated, by resistance of actual worlds. It need not impinge on actual worlds. And that resistance remains. But it is resistance supplied through central evaluation conditions, by such features as *actuality*, *factuality* and *existence*. These features demarcate categories that are hard to enter. By

[1] For details, see Parsons 1980, Note that the feasibility of alternatives does mean that such basic distinctions as those into nuclear (characterizing) predicates and other predicates are more flexible than previously supposed; such distinctions and classifications succumb to a certain relativity. In any case, their complete rigidity always appeared an artifice.

no means anything goes in these areas. It is here that *ontology* – otherwise a major distraction in philosophy, and a serious impediment to legitimate problem-solving – imposes its proper barriers.

There will, naturally then, be external constraints on how a favourably-located theory goes, especially if it is drawn from and answers to a field of experience or controlled investigation. The guarantee of freedom afforded does not, without further ado, extend far beyond the theory concerned. A religious theory cannot impose its assumptions or speculations, for free, upon an actual world. Theory-independence or realisation has to be earned or won. It is most easily achieved, as by special theories of mathematics, by remaining respectfully beyond the existent, by fruitful commerce with nonexistents.

Matching liberalised item-theory to a worlds semantical story (also continuing all the while in this mixing of pictures and stories) helps to clarify some obscurities. The central zone is central in its comparative age as part of object-theory. As central parts of unplanned cities usually become established first, usually by virtue of some geographic or other advantages, so a central part of item-theory became established early on by virtue of its apparent explicative advantages. As various disadvantages became evident it has been reshaped and to some extent refined and rebuilt. More to the semantic point, parts of the central zone are central as regards commerce with truth. The central zone is part of an actual world, a rich actual world which includes in its item domain a full variety of nonexistent items.

By contrast, a suburban region may, or may not, overlap such an actual world, or make a contribution to truth as thereby determined. Arbitrary postulation is unlikely to achieve truth, though it will determine features of the world or worlds it corresponds to, and what holds there. That is, noncentral zones usually correspond to nonactual worlds. That is one reason why not much notice need be taken of most scientific speculation as far as truth is concerned. Speculation is like postulation; without much due preparation it contributes nothing to truth-likeness. However, well-characterised items of an apparently successful and fruitful suburban or outlying area may be upgraded to actual world status.[1] Arithmetic, which works well for favoured discrete objects is one example; quantum theory which delivers apparently correct results for previously unaccounted-for data is another.

[1] A key idea of pragmatism appears here, hopefully in improved form. For there is a neoplatonic tendency to represent "upgrading" in degrees-of-reality terms – a tendency, based on ontological assumptions, that should be resisted.

Correspondingly a failing theory may be degraded, or demoted, to more suburban other-world status; the pictures it assigned its objects do not hold truly any more (and never did, according to historical adjustment). It emerges then that central zones do not have a monopoly on contribution to rich actual worlds: noncentral areas may also make important contributions.

Finally, liberalisation inflates inexistentially the logical space and setting of item-theory, allowing room for expansion of the theory and significant scope for rehabilitation of logically degraded landscapes. One significant direction for development of item-theory lies in investigation of extramathematical items of various sorts, items violating the requirements of standard extensional mathematical theories for example. Among such very different sorts of items are the following: vague items (which run into trouble with countability requirements), variable items, set-like items (which do not conform to ZF postulates), empty items (such as holes and vacuums), subjective items, items of faculty psychology such as Reason, Will, etc., items of dying or dead scientific theories, metaphysical items such as those of oriental philosophies, and so on for many other sorts of neglected items.

Formal appendix: some recent criticisms of Meinong's theory

While Meinong's object-theory is not really the first theory of objects, as leading themes had been appreciated earlier, it is presumably the first *explicit* theory, it does advance far beyond anything previously presented, and it does offer, for the first time, due treatment of objects beyond the possible. (Requisite qualifications to this claim can be set down against the splendid indeterminacy of notion of a *theory*). But Meinong's object-theory, though dignified by the honorific title of 'theory' unlike earlier more rudimentary theories of objects, is quite insufficiently explicit on several critical issues. One of these issues concerns the range of impossible and paradoxical objects Meinong's theory "countenances", and whether it is duly paraconsistent or dialethic.[1] In this, as on many other issues, Meinong's theory is certainly different from item-theory.

Another crucial issue, this time for the viability of the theory, is this: Does Meinong's theory of objects include, sustain, or lead to an unrestricted Characterisation Postulate (CP)? On the one side there is no firm basis for supposing that it does.

[1] The issue is discussed in $EMJB_1$, chapter 5 [reprinted in $EMJB_2$, Vol. 2, chapter 5 *—Eds.*].

At most Meinong gives *examples* of the CP at work, typically drawing from a quite narrow range of predicates, as in 'the blue object', 'the round square' and the like. But all the examples support are more obvious forms of a restricted CP, a principle where the predicates involved are restricted to nuclear or characterising ones. It is doubtful in the light of the textual evidence that Meinong's "theory" contains an unrestricted CP; such a restricted principle holds only for "Meinong's theory".

It is no longer any great feat to establish contradictions, and worse triviality, in theories of objects with insufficiently restricted characterisation *postulates*. One very easy way to derive a contradiction in "Meinong's theory" is as follows: let c be $\imath x(g(x)\ \&\ \neg g(x))$, with $\neg$ representing a wide negation. Then by immediate applications of an unrestricted CP, $g(c)\ \&\ \neg g(c)$. For suitable "negation" $\neg$ this issues, in turn, in triviality, e.g. where $\neg A \rightarrow .\ A \rightarrow F$ and $F \rightarrow B$.

Another paradox which may be derived in "Meinong's theory" is the following (devised by R. Orayen): Let $p(x)$ be a predicate and c a name. Consider the pair of separately consistent descriptions: $\imath x(p(x)\ \&\ x = c)$ and $\imath x(\neg p(x)\ \&\ x = c)$. Then by identity principles and a (very dubious) CP:

1) $\imath x(p(x)\ \&\ x = c) = c$
2) $p(\imath x(p(x)\ \&\ x = c))$
3) $p(c)$
4) $\imath x(\neg p(x)\ \&\ x = c) = c$
5) $\neg x(\imath p(\neg p(x)\ \&\ x = c))$
6) $\neg p(c)$

Therefore, $p(c) \wedge \neg p(c)$. The point of Orayen's paradox is said to be that a contradiction is derived without the use of "contradictory" descriptions. But rather (as in the well-known policeman-prisoner paradox) there are separately consistent descriptions which jointly yield inconsistency. Different item-theories will offer different resolutions of this, as of other semantical paradoxes. Classically-based theories, for instance, cannot adopt an *obvious* paraconsistent approach, as Meinong may have done if pressed.

Yet another paradox is the following: $\imath p(p$ is false), where 'p' is a propositional variable. Upon setting $k = \imath p(p$ is false), the contradiction $k \wedge \neg k$; follows. This paradox also has an obvious Curry form, e.g. $\imath p(p$ implies everything). Should we introduce numerical variable binding term operators, say $\in\leqslant_2$, $\in\leqslant_3$ etc., the paradoxes can be multiplied. More generally, it *seems* that all common types of paradoxes can be derived

in "'Meinong's theory". In the light of such paradoxes, da Costa n.d. tentatively suggests that Meinong's theory itself is "potentially" trivial (or inconsistent), though not actually trivial. Indeed, in da Costa's opinion, this is precisely what happens with the English language, and all natural languages; they are "potentially" trivial. But a restricted CP of some sort is not, and not 'potentially', an unqualified CP – any more than a restricted comprehension axiom, or right to slaughter whales for "scientific purposes", is "potentially" an unrestricted axiom or open slaughter. Moreover, these paradoxes are arguments that only not entirely sympathetic supporters would try to foist on Meinong; and their alleged extension to natural language exhibits a somewhat hostile, exact philosophy, approach to it.*

* This paper expands, revises, and supersedes, 'Item-theory further liberalized', which fortunately never achieved much public exposure. It was prepared for an invited address at the World Congress of Philosophy, Brighton, 1988 (for which I failed to obtain travel funding) and for a conference near Bolzano (where available funding was, late on, frozen by a directive of the central Italian government). But this unfortunate paper did have the benefit of a detailed commentary by Nick Griffin, especially as regards distinction between types of "assumptions".

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References

$EMJB_1$ Routley, R., *Exploring Meinong's Jungle and Beyond*, Research School of Social Sciences, Australian National University, 1980.

$EMJB_2$ Routley, R. et al., *The Sylvan Jungle*, edited by M. Eckert et al., vol. 1–4, Springer Verlag, Berlin, forthcoming.

Barfoot, J., *Gaining Ground*, The Womens Press, London, 1978.

Baudrillard, J., *The Mirror of Production*, Telos Press, St. Louis, 1975.

Broad, W. and Wade, N., *Betrayers of the Truth*, Simon & Schuster, New York, 1983.

Church, A., *Introduction to Mathematical Logic*, Princeton University Press, 1956.

da Costa, N.C.A., Personal communications, some parts of which appear in articles on object-theory.

Fine, K., "Critical Review of Parsons", *Philosophical Studies* (1984) 95–142.

Fraenkel, A., Bar-Hillel, Y. and Levy, A., *Foundations of Set Theory*, North Holland, Amsterdam, 1973.

Franklin, A., "Forging, Combing, Trimming and Riding on the Band Wagon", *American Journal of Physics* **152**.9 (1984) 786–793.

Goddard, L. and Routley, R., *The Logic of Significance and Context*, Scottish Academic Press, Edinburgh, 1973. Referred to as SL.

Jackson, P., *Introduction to Artificial Intelligence*, Petrocelli Books, New York, 1974.

Johnson, L.E., *A Morally Deep World*, Discussion Papers in Environmental Philosophy No. 17, RSSS, Australian National University, 1987.

Levins, R. and Lewontin, R., *The Dialectical Biologist*, Harvard University Press, Cambridge, Mass., 1985.

Lytton, E.B., *The Last Days of Pompeii*, George Routledge, London, 1850.

Nagel, T., *Mortal Questions*, Cambridge University Press, 1979.

Parsons, T., *Nonexistent Objects*, Yale University Press, New Haven, 1980.

Passmore, J., *A Hundred Years of Philosophy*, Second edition, Duckworth, London, 1966.

Priest, G. et al., *Paraconsistent Logic*, Philosophia Verlag, Munich, 1989.

Priest, G., "On a paradox of Hilbert and Bernays", *Journal of Philosophical Logic* **26** (1997) 45–56.

Schoenfield, J.R., *Mathematical Logic*, Addison-Wesley, Reading, 1967.

Sylvan, R., *Transcendental Metaphysics: from radical to deep plurallism*, The White Horse Press, Cambridge, 1997. Referred to as TM.

The future perfect of *Exploring Meinong's Jungle and Beyond*

Filippo Casati

Let's begin from the end. When, in 1996, Routley unexpectedly died, a great part of the philosophical community was shocked. Graham Priest could not even believe it: "Richard dead. Never again would I see him. Never again would we talk, share ideas, problems, a bottle of wine".[1] Getting into the car, at the end of his last trip to Richard's house, he realized that he was driving off"into a world that [without Routley] would never be the same again".[2] Bob Meyer was incredulous as well and, for a long time, he was not able to accept Routley's death claiming that it would have been in character for him to be fooling us, spreading the rumor of his death for some deep purpose. Unfortunately, for Routley, there were no reasons to stage his death: he was simply gone. For real and for ever.

Despite Routley's premature departure, his memory is kept alive by all his innovative contributions to logic[3], metaphysics, ontology[4] and environmental theories.[5] But that's not everything: he has also left a remarkable number of documents which are, at least for the great majority, currently unpublished. For instance, right before dying, he was working on two long manuscripts concerning formal logic. The first one is about the possible applications of relevant logics in the philosophy of science: this project was picked up by Graham Priest and Dominic Hyde and it was eventually published with the title *Sociative Logics and Their Applications*.[6] The second one is meant to be an

[1] Priest 2005, p. 125.
[2] Priest 2005, p. 133.
[3] Routley 1977, Routley, Meyer, Plumwood and Brady 1982.
[4] Routley 1966, Routley and Routley 1979.
[5] Sylvan 1985.
[6] Sylvan 2000.

expansion of *Relevant Logics and its Rivals* and it has been developed by Ross Brady. Finally, concerning both epistemology and metaphysics, a mammoth amount of material was stored in Routley's office and Nick Griffin prepared it for publication.[1] Nevertheless, a relevant part of Routley's manuscripts still remain unread. In particular, no one has discussed his unpublished attempts to develop his ontological theory, called noneism. Using the archive material, this paper will try to sketch the main features of the new theory that Routley was developing before dying.

Before continuing, a qualification is required. As the attentive reader will notice, some of the features of the revised item theory discussed here were already presented by Routley in his paper entitled 'Re-exploring Item Theory' (see this volume). Even though that paper represents a first public attempt to further develop Item Theory, the archival material is richer in philosophical intuitions, important details and examples. Also, it contains more information about how Routley planned to organize these ideas in a whole new long manuscript. For this reason, we will mostly rely on the unpublished documents.

Routley's minimal noneism

Before discussing the developments of Routley's theory of non-existent objects sketched in the archival material, we will briefly recall his ontology. As the hundreds of pages of *Exploring Meinong's Jungle and Beyond* can easily suggest, such an ontology was developed in great detail. However, it is possible to summarize it in five main theses, which represent the core assumptions of what Routley himself calls *Minimal Noneism*, namely, the heart of this theory.[2] First of all, he believes that:

A1. Everything whatever – whether thinkable or not – is an object.

It is important to highlight that, in disagreement with Meinong, Routley does not directly equate 'object' (in Meinong's jargon, *Gegenstände*) with 'object of thought'. Routley neither assumes that *only* what is thinkable is an object nor that, because everything is an object, everything is thinkable. On the contrary, according to (A1), he claims that everything is an object including what may not be, strictly speaking, thinkable. From

[1] Sylvan 1997.

[2] A version of these theses can be found in $EMJB_2$, p. 3.

here, it trivially follows that:

A1*. Every intentional object (everything we refer to with a cognitive activity) is an object as well.

Even though it is not the case that all objects are objects of thought, all objects of thought are objects. In other words, since everything is an object, every time we refer to some*thing*, we refer to an object as well. For instance, if I tell a story about a golden mountain, I tell a story about an object, namely the object of my story which is a golden mountain. If I dream about the Eiffel Tower, I dream about an object, namely the object of my dream, which is the Eiffel Tower. For obvious reasons, a golden mountain and the Eiffel Tower are very different kinds of objects: for instance, a golden mountain is the object of a fictional story and the Eiffel Tower is the object of my dream. Nevertheless, in Routley's theory, both of them are objects. It is also important to specify that, since (A1) is unrestricted, it leaves open the possibility that some objects may be inconsistent. Inconsistent objects are objects which instantiate inconsistent properties. For instance, Graham Priest, in his Sylvan's Box[1], tells a story about a box that is empty and, at the same time, not empty. Therefore, such a box has inconsistent properties: it instantiates the property of *being empty* and its negation, namely the property of *not being empty*. However, as the golden mountain is part of my story, Sylvan's box is part of Priest's story. As such, according to (A1), both of them are objects.

The second thesis endorsed by Routley is that:

A2. Very many objects do not exist.

Here Routley follows the intuition of Meinong in claiming that some objects exist and some others do not. Intuitively, the Eiffel Tower exists (it is in France, it was built in 1889 and, if we visit Paris, we can take a picture in front of it), while a golden mountain does not exist (there is no golden mountain in the real world, it was invented by the Grimm brothers and we cannot take a picture in front of it). Thus, Routley thinks that existence is a property[2]: as some objects instantiate the property of *being red* and some

[1] Priest 2005.
[2] Cf. Routley 1966.

other objects do not, some objects instantiate the property of *being existent* (like the Eiffel Tower) and some other objects do not (like the golden mountain). If an object does not instantiate the property of *being red*, this object is not red; if an object does not instantiate the property of *being existent*, this object does not exist. In Routley's terminology, nonexistent objects are called 'nonentities'. Now, according to the third and the fourth theses endorsed by Routley:

A3. Non-existent objects [or nonentities] are constituted in one way or in another

because

A4. Every object has the characteristics it has irrespective of whether it exists.

Regardless of its ontological status, every object is an object and, as such, it has some characteristics. Routley uses 'characteristic' as a synonym of 'property'. On the one hand, the Eiffel Tower exists and it has some characteristics (or properties): it is a tower (or it instantiates the property of *being a tower*) and it is made out of iron (or it instantiates the property of *being made out of iron*). On the other hand, the golden mountain does not exist but it has some characteristics (or properties) as well: for instance, the golden mountain is golden (or it instantiates the property of *being golden*) and it is a mountain (or it instantiates the property of *being a mountain*).

As it is stated until now, Routley's position looks similar to the one endorsed by the so-called naive Meinong[1]: according to Meinong, every object has a *Sosein*, namely a set of properties instantiated by the object in question. In the *Sosein* of some objects there is the property of *being existent* [*Sein*] while, in the *Sosein* of some other objects, the property of *being existent* is lacking. According to Meinong, since nonexistent objects are nonexistent, they instantiate the property of *being nonexistent*. Thus, the *Sosein* of nonexistent objects contains the property of *being nonexistent* [*Nichtsein*]. This means that, in the *Sosein* of the Eiffel Tower, there is the property of *being existent* while, in the *Sosein* of the golden mountain, there is the property of *being nonexistent*.[2]

[1] Meinong 1904.

[2] We are aware that the analogy between Routley and the naive Meinong is actually more complicated than is presented here. Indeed, Alexius Meinong endorses ontological pluralism, namely the view

In summary, according to (A1*), which is an instantiation of (A1), everything I can refer to is an object and, according to (A4), every object has the properties that it has. Once again, the golden mountain is the object that I refer to in telling a story about a golden mountain and, as such, it instantiates the property of *being golden* and the property of *being a mountain*. Moreover, since no golden mountain exists, this object instantiates the property of *being nonexistent* too. In other words, the golden mountain I refer to in telling a story about a golden mountain is an object and, since it is an object, it has a *Sosein*. Moreover, the *Sosein* of the golden mountain I refer to contains the property of *being golden*, *being a mountain* and *being nonexistent*.

Generalizing this position, we can say that, given what has been presented so far, this theory seems to work on the principle that every time we refer to something described as '*such and such*', there is an object which is, so to speak, '*such and such*'. In other words, given any set of properties (given any *Sosein*), there is an object (either existent or nonexistent) instantiating those properties. Such a principle has been called the *unrestricted characterization postulate* (UCP), and it is possible to formally describe it in the following way:

UCP. For any condition $\alpha[x]$ with free variable x, some object exactly satisfies $\alpha[x]$.

By 'condition' we mean a formula expressing a "describable set of properties" in the theory's language. From (UCP), it follows $Px\,\alpha[x]$, for any condition $\alpha[x]$. According to Routley's notation, P represents the existentially unloaded particular quantifier. Moreover, it is also possible to intuitively understand $\alpha[x]$ as the *Sosein* of an object, namely the conjunction of all its properties.

At this point, there is a problem. As both Meinong and Routley were perfectly aware, any ontology grounded on (A1), (A4) and (UCP) is both ontologically and logically trivial. I take ontological triviality to be the situation in which everything exists (including items that clearly do not). I take logical triviality to be the situation in which, given a theory, any sentence would be derivable as a theorem.

Let's start with **ontological triviality**. According to (A1), everything I can refer to is an object and, according to (A4) and (UCP), every (existent or nonexistent) object

according to which some objects exist in different ways than others. Routley rejects ontological pluralism endorsing the idea that 'existence' is a univocal term.

has the characteristics that it is characterized as having. As we have seen, from here, it follows that if I refer to an object x and this object is a nonexistent golden mountain, such an object satisfies the following conditions: $\alpha[x] = x$ is a mountain and x is golden and x is nonexistent. Given (UCP), we can formally write it in the following way: $Px(Mx \wedge Gx \wedge Nx)$ where P is the existentially unloaded particular quantifier, M is the predicate *being a mountain*, G is the predicate *being golden* and N is the predicate *being nonexistent*. In traditional Meinongian terms, we can say that, in its *Sosein*, this object x, namely the nonexistent golden mountain, has the property of *being a mountain*, *being golden* and *being nonexistent*. So far, there are no problems at all.

But what happens if we refer to an existent golden mountain? Well, according to (A1*), as with the nonexistent golden mountain, the existent golden mountain is an object too. In both cases, we refer to them. Moreover, according to (A4) and (UCP), the existent golden mountain satisfies the following conditions: $\alpha[x] = x$ is a mountain and x is golden and x is existent. Since according to (UCP), given any set of properties, there must be an object which instantiates those properties, the case of the existent golden mountain is not an exception: given a set of properties (given a *Sosein*) containing the properties of *being golden*, *being a mountain* and *being existent*, there must be an object which instantiates these properties (namely an existent golden mountain). Once again, given (UCP), we can formally write this idea in the following way: $Px(Mx \wedge Gx \wedge Ex)$ where P is the existentially unloaded particular quantifier, M is the predicate *being a mountain*, G is the predicate *being golden* and E is the predicate *being existent*. If we use an existential quantifier, namely a qualifier that is not existentially unloaded, we can also write: $\exists x(Mx \wedge Gx)$.

Now, this is an unpleasant outcome for two main reasons: first of all, according to this ontology, there is an object that is an existent golden mountain. However, this is empirically false because, as we know, a golden mountain does not exist. The second (and more important) unpleasant outcome is that, from (UCP) (namely from the fact that, given any set of properties, there is an object instantiating those properties), ontological triviality follows: everything exists because it is possible to characterize everything that does not exist as existent. To see it, first of all, consider all the (probably infinite) non-existent objects. As we know, for each of them, there is a corresponding *Sosein* which contains, among many other properties, also the property of *being nonexistent* [*Nicht-Sein*]. Secondly, in each *Sosein* of these non-existent objects, substitute the property of

being non-existent with the property of *being existent*. At this point, we will have the same objects with the same *Sosein*, but instead of being non-existent, they will all be existent (because they are characterized as such). Thus, since, according to (UCP), every characterization (every *Sosein*) corresponds to an object with that characterization (with that *Sosein*), everything exists because we can characterize all non-existent objects as existent.

Let's now discuss **logical triviality**. As Priest has already shown, (UCP) allows us to prove, not only any existential statement, but anything whatsoever. Let $\alpha[x]$ be $x = x \wedge \beta$, with β standing for any sentence. Applying (UCP) and Leibniz's Law, we have that for exactly one object, say b, it is true that $b = b \wedge \beta$; from which β follows, by Conjunction Elimination. This means that any formalized theory including (UCP) would be trivial, in the logical sense that any sentence would be derivable as a theorem.[1]

In order to avoid this problem, Routley introduces the distinction between characterizing and non-characterizing properties. The former ones are properties that are necessary in order to define the essence of an object. A characterizing property is a property that is necessarily in the *Sosein* of an object in order to make that object the object that is. For instance, the property of *being a tower* is essential to characterize the Eiffel Tower and the property of *being a mountain* is essential to characterize the golden mountain. Using Routley's words: "Characterizing predicates [or properties] are those which specify what an item is *like*, in itself. (. . .) They tell how an item is in fact. They give its description. [In a sense,] a good dossier of an item would perhaps give its characterization first, by ways of its characterizing features [or properties]".[2] On the contrary, the non-characterizing properties are all the properties that are not characterizing properties.

As it has been already argued in the secondary literature[3], the difference between these two kinds of properties is very vague. A possible way to make sense of this distinction is to compare it with Parsons' distinction between nuclear properties (Routley's charactering properties) and extra-nuclear properties (Routley's non-characterizing properties). In his *Non-Existent Objects*[4], Terence Parsons classifies the extra-nuclear

[1] For more details, Berto 2013, p. 106.
[2] Sylvan 1995b.
[3] For instance, Priest 2005, Chapter 4.
[4] Parsons 1980, pp. 22–3.

properties in four main categories: *ontological properties* (such as *being mythical*, *being fictional*), *modal properties* (such as *being possible*, *being necessary*), *intentional properties* (such as *being thought*, *being dreamt*) and *technical properties* (such as *being complete*, *being incomplete*).[1] Even though it is not easy to determine if Routley would have agreed with Parsons' cataloging, it is clear that both of them take the property of *being existent* to be a non-characterizing one. Routley explicitly claims that:

A5. Existence is not a characterizing property.

Moreover, Routley uses the distinction between characterizing and non-characterizing properties to avoid ontological and logical triviality. First of all, he reinterprets (A4) in the following way:

A4*. Every object has the characteristics [namely the characterizing properties] it has.

Secondly, he constrains (UCP) to only characterizing properties. According to this idea, the principle according to which, given any set of properties (given any *Sosein*), there is an object instantiating those properties, needs to be specified in the following way: given any set of characterizing properties (given any *Sosein* of charactering properties), there is an object instantiating those charactering properties. In other terms, the characterization postulate is now restricted to characterizing properties only. Let's call this new principle the *restricted characterization postulate* (RCP). Formally, we can say:

RCP). For any characterizing condition $\alpha[x]$, with free variable x, some object satisfies $\alpha[x]$.

By 'characterizing condition' we mean a formula expressing a 'describable set of characterizing properties'. $\alpha[x]$ is the *Sosein* of an object, which contains only characterizing properties. For instance, when we refer to the existent Eiffel Tower, we refer to an object which satisfies the following conditions: $\alpha[x] = x$ is a tower and x is made out of iron. The property of *being existent* is not considered because, as we have seen, it is a non-characterizing property. In the same way, when we refer to the existent golden mountain,

[1] For a more detailed account of nuclear and extra-nuclear properties, Berto 2013, pp. 116–7.

we refer to an object which satisfies the following conditions: $\alpha[x] = x$ is a mountain and x is golden. Thus, ontological and logical triviality is avoided: even though it is still true that every *Sosein* corresponds to an object, it is not true that all objects exist because the property of *being existent* is not a property, which belongs to any *Sosein*.

So, what about the existent golden mountain? What object do we refer to when we refer to the existent golden mountain, if not an existent golden mountain? Since (A1*) still holds (since every time we refer to something, we refer to an object), what kind of object do we refer to, when we refer to the existent golden mountain? This issue, as many others, remains open in Routley's ontology.[1]

Routley's item theory revised

Immediately after the publication of *Exploring Meinong's Jungle and Beyond*, Routley started working on a new manuscript proposing a development of noneism. Unfortunately, this manuscript has never been completed because of Routley's premature departure. Nevertheless, we still have some notes that can help in sketching, at least, the general features of this new theory of non-existent objects. In these notes, Routley seems to be unsatisfied with the current state of noneism and he claims that "th[is] theory has moved on, beyond that of JB [this is how Routley refers to his *magnus opus* in his private notes]".[2] It is important to specify that, in this new manuscript, Routley does not want to reject noneism because "JB remains as a solid background. JB is not abandoned, rather expanded. Indeed, all the negative claims, criticisms [still] stand. In particular the critique of the reference theory [and the Quinean ontology] stands: it is fundamental".[3] Routley wants to keep alive the Meinongian idea that we can meaningfully and truthfully refer to non-existent objects: as we have seen examining theses (A2) and (A3), this is one of the main features of minimal noneism too. However, he also thinks that both minimal noneism and, more generally, noneism have two aspects that need to be improved. The first aspect concerns the style of JB, which was too complicated and verbose; the second aspect concerns the philosophical content of noneism, which was considered by Routley, himself, not liberal enough. Let's discuss them in more detail.

[1] For more details on this problem, Berto 2013, p. 125.
[2] Sylvan 1995d.
[3] Sylvan 1995d.

JB made easier

According to Routley, "JB was too big": Richard seems to realize that its impressive number of pages and its convoluted style has often "intimidated too many potential readers".[1] For this reason, he tries to reconstruct his theory in a more accessible way. In a two-page note entitled 'Item Theory Made Easier', he starts characterizing noneism as an heretical theory which challenges the traditional dogma according to which all objects exist.

> Human thoughts and practice have always been parochial. The legacy of much of this parochialness remains in a great deal of our language: witness the etymological history of terms like *world*, *theory*, *reality* etc. etc. Much of more adventurous philosophical thought aims to escape such parochialness, proceeding beyond local bounds of consistency, existence and so on. Item theory is part of this push. It is concerned with removing the prejudice in favor of the actual, of what exists, and in obtaining fair philosophical treatment of what does not exist.[2]

In order to do so, this revised version of Item Theory is directly grounded on "common sense" and, in particular, on "the commonsense admission of a wide variety of items into the scope of the theory, including many important types that are regularly excluded in mainstream philosophizing".[3] From this point of view, Routley returns to the uncompromising "phenomenological style of Meinong"[4] according to which "knowing is impossible without something being know and (...) judgements are impossible without being judgements about something. (...) We are happy about something and, at least in the majority of cases, do not wish without wishing for something".[5] Routley wants to defend the intuitive idea that, regardless of any technical (and probably artificial) distinction between characterizing and non-characterizing properties, an object has the properties that it has according to its *source*. More precisely,

[1] Sylvan 1995b.
[2] Sylvan 1995b.
[3] Sylvan 1995b.
[4] Sylvan 1995b.
[5] Meinong 1904, p. 76.

> Every item has a *source* of some sort (...). For fictional characters, for instance, the source is a text or a set of texts. For theoretical objects, the sources are the appropriate theories. For empirical items, a prime source is experience or, more generally, aspects of a world of experience.[1]

According to Routley, the object's *source* is what makes an object exactly what that object is. In other words, the object's *source* characterizes an object as '*such and such*'. For instance, if we want to know some of the features of the golden mountain we should read Grimm's story, which is (one of) the source(s) of the golden mountain; if we want to know some of the features of the Eiffel Tower, we should go to Paris or, as Routley metaphorically suggests, we should read "the book of reality, the book of the world".[2] The world and reality is the source of information for the Eiffel Tower.

The interesting point is that, according to Routley, the *source* of an object determines *all* the features of an object with no constraints of any sort. An object is completely characterized by all the properties that it is described as having in its *source*.

> Every item has a *source*, which supplies all the information as to what it is like. Sources are many and various. They include such items as book, poems, myths, theories, films, theatre, rituals, dreams, perceptions, sketches, scenarios, descriptions, postulate systems and so on. (...) Every item has a *source* of some sort which supplies its characterizing properties and perhaps other properties or supposed properties as well.[3]

In this simplified version of Item Theory, the *source* of an object determines all the properties instantiated by an object regardless of the fact that these properties may be characterizing or non-characterizing ones. Such a re-orientation of Routley's ontology simplified the theory because now, as Routley himself points out, the five theses on which minimal noneism is grounded – (A1)-(A5) – are reduced to two:

B1. "Every grammatically well-form subject (term) signifies an item."[4]

[1] Sylvan 1995b.
[2] Sylvan 1995b.
[3] Sylvan 1995b.
[4] Sylvan 1995b.

and

B2. "Items have their properties whether or not they exist".[1]

In other terms, any grammatically well-form subject refers to an object which has the properties that it has according to its *source*. It is easy to notice that, in both (B1) and (B2), the distinction between characterizing and non-characterizing properties has disappeared. Thus, the Grimm brothers' story is about a golden mountain: this golden mountain is an object and the Grimm brothers' story is its *source*. Since any object is fully described by its *source*, the golden mountain is fully described by Grimm brothers' story. Moreover, since, in the Grimm brothers' story, the golden mountain is existent, the golden mountain characterized in the Grimm brothers' story instantiates the property of *being existent*. As we have seen, this conclusion would not have been acceptable in the framework presented in JB.

At this point, it is evident that this re-organization of the structure of Item Theory necessarily entails some modifications in the content of the theory as well. Routley is aware of this and he claims that, given this new account of JB, two major changes are required. He writes: "the re-orientation of item theory suggested here lies (1) in the number and varieties of items given standing and (2) in the characterization of items or in the specification of what particular items are like".[2] In what follows, we will examine both these modifications.

The liberalization of JB

Let's start considering the first kind of modification. Routley suggests that, according to (B1) and (B2), it is necessary to extend and increase the catalogue of items. As we have previously explained, according to *Exploring Meinong's Jungle and Beyond*, everything is an item. According to (A1), everything whatever – whether thinkable or not – is an object. Routley does not disagree with this idea; however, he thinks that, given (B1), it is possible to include in the catalogue of items also something that is not an item

[1] Sylvan 1995b.
[2] Sylvan 1995b.

only. For instance, consider the case in which a grammatical well-formed subject signifies something that is not an item. Suppose that I tell a story and that the main character of this story is nothingness, namely, something that is characterized as what is not an item. According to (B1), since nothingness is the well formed subject of my story, nothingness has to be an object. However, since the *source* of nothingness (that is my story) describes nothingness as something that is not an object, and since the *source* of an object fully characterizes the object itself, it follows that nothingness has to be something that is not an object. Thus, nothingness is an object – because of (B1) – and it is not an object (because it is described as such in its *source*). Routley proposes a similar example: "Here is a new object, *Bugboo*. Suppose that *Bugboo* is not an item. Then, *Bugboo* is also an item [albeit an entirely nondescript one]".[1] In his revised version of Item theory, Routley suggests that, even though everything is an object, there is something that is an object and not an object as well.

Let us continue with the second kind of modification. As we have seen before, the new orientation of Item Theory seems to require an *unrestricted characterization postulate* because it gives up the idea that an object is characterized only by its characterizing properties. According to the *desiderata* of the new JB, an object is characterized by all the properties that the object itself instantiates, regardless of the 'nature' of such properties. In order to accommodate this idea, Routley has to abandon the *restricted characterization postulate* (RCP) and find another solution which does appeal to the *unrestricted characterization postulate* (UCP). Indeed, as we have previously argued, (UCP) leads to both logical and ontological triviality. So, what is the solution proposed by Routley in the archival material?

To begin with, Routley is well aware that, even though (RCP) avoids logical and ontological triviality, it faces a problem – it makes it impossible to characterize *all* objects. Indeed, (RCP) allows us to characterize objects ranging exclusively over characterizing properties. From this point of view, (RCP) cannot guarantee that, given (A1), everything is an object. Indeed, since everything that is an object has a characterization and since, for instance, (RCP) cannot deliver a complete or full characterization of an existent golden mountain (but only of a golden mountain), (RCP) rules out that everything is an object. Indeed, an existent golden mountain is not. From this point of view, the powerful feature of Meinong's ontology according to which everything we can refer to

[1] Sylvan 1995a.

is an object (and consequently it has a characterization) vanishes with the adoption of (RCP). Even though we can intuitively refer to the existent golden mountain, there is no object characterized as *being golden*, *being a mountain* and *being existent*. This is how (RCP) restricts the ontological freedom guaranteed by (A1). In this sense, the "freedom of assumption has been advertised as a major feature of item-theory; but that ambiguous freedom was underpinned and rendered feasible by a heavily qualified freedom of characterization".[1] More precisely, "there is a serious limitation to item-theory as so far developed recently. That limitation lies in the restriction of assumption, through certain characterization postulates, of the carefully qualified form that objects have all their characterizing feature".[2] At this point, since Routley is clearly unsatisfied with this restricted form of freedom, the question is: is it possible to modify item-theory in such a way that the freedom of assumption is not ambiguous? How can we change item theory in order to obtain an unrestricted freedom? Or, in Routley's words, can we obtain a development of item-theory that is "liberalized" and in which "postulates [namely descriptions of objects] are *freely* chosen"?[3]

Unfortunately, Routley does not fully answer these questions. Nevertheless, in the archival material, we can find a general sketch of the strategy that Routley was pursuing before dying. According to Routley, it is possible to further liberalize item-theory by drawing a distinction between different, so to speak, ontological 'regions'. In some ontological regions, the old characterization postulate, namely (RCP), still holds: this means that, in these regions, it is not possible to fully or unrestrictedly characterize objects such as the existent golden mountain. However, in some other ontological regions, (UCP) holds and, therefore, it is possible to unrestrictedly characterize all objects, including the existent golden mountain. In order to explain this idea, Routley proposes a metaphor. The regions where the restricted characterization postulate holds are like urban regions – they are civilized and nothing weird or unusual happens. These regions are like the center of our cities: we are familiar with them. They are regions in which we exactly know what we should expect to find. For instance, in these regions, we are well aware that there are no objects such as the existent golden mountain. These regions are defined by Routley himself as "central" or "urban".[4] On the contrary, the regions where

[1] Sylvan 1995a.
[2] Sylvan 1995a.
[3] Sylvan 1995a.
[4] Sylvan 1995a.

the unrestricted characterization holds are like the rural regions – they are the jungle, in which we can find unusual and unexpected things (such as the existent golden mountain!). Following Routley, these regions are "suburban".[1] The old item-theory is only about the urban regions because it exclusively employs the restricted characterization postulate, while the new liberalized item theory includes also the suburban regions because it employs the unrestricted characterization postulate as well. This is how Routley sketches his new ontological universe:

> Item-theory can be separated into two interconnected, sometimes overlapping but not exhausting, parts: central and suburban. The central region coincides with older item-theory, as constrained by characterization postulates of type CP [namely (RCP)]. In suburban regions, such specific characterization postulates may not apply or operate. In the suburbs, items are characterized though different postulates, appropriate to suburbs.[2]

The expansion of the old item theory to the suburbs is exactly what guarantees the possibility of increasing the freedom of characterization because it corresponds to the switch from the restricted characterization postulate to the unrestricted one. Routley writes: "Liberalization begins with the suburbanization"[3] because "the huge suburban and rural reaches of item-theory consist of a *characterization-relaxed* theory where narrow characterization postulates get displaced".[4]

Leaving the metaphor aside, Routley tries to give a description of this new item-theory employing possible and impossible worlds. On the one hand, the urban regions are the regions that correspond to the actual world. On the other hand, the suburbs correspond to possible and impossible worlds. Exactly because the possible and impossible worlds are not the actual one, the possible and impossible worlds (namely the suburban regions) can host objects such as the existent golden mountain and (why not?) the existent square triangle. "Freedom of characterization is not qualified (...) by resistance of the actual world. It need not impinge on the actual world".[5] Moreover, since everything is an object and everything is characterizable, Routley also contemplates the idea of having

[1] Sylvan 1995a.
[2] Sylvan 1995a.
[3] Sylvan 1995a.
[4] Sylvan 1995a.
[5] Sylvan 1995a.

trivial worlds, namely worlds where everything (literally everything!) is true. Indeed, as it was recently shown by Wildman and Folde[1], it is possible to tell a story about a world where all propositions and their negations are true. As such, a trivial world is characterizable. Given the new item-theory, this does not constitute a problem because a trivial world is not the actual one and, using Routley's metaphor, it is simply one of the most obscure, remote and far away regions of the jungle. "The result [of the new item theory] is that some special theories of items are trivial. Such triviality does not matter; it is to be expected, and the diagnosed theory will be set aside as no longer interesting. Nor does that triviality spread or infect the rest of the broad theory. (...) Trivial worlds are very far from the actual".[2]

To conclude, one question remains unanswered. Since this new item-theory employs the unrestricted characterization postulate and since the unrestricted characterization postulate leads to logical and ontological triviality, does the new item-theory avoid such an unpleasant solution? And, if the answer is positive, how can it be so? The new item-theory avoids the ontological and logical triviality previously faced by (UCP) because, in this new theory, (UCP) does not hold for all the ontological regions (or worlds) but only for some of them. This means that, even though it is true that all objects have the properties that they are characterized as having, it does not necessarily mean that they instantiate these properties in the urban ontological regions (namely in the actual world). They can instantiate these properties in the suburbs (namely in possible and impossible worlds). For instance, the new item theory gives us the freedom to characterize the existent golden mountain as something that instantiates the property of *being gold*, *being a mountain* and *being existent*. As such, there is an object that corresponds to this characterization. However, from here, it does not follow that such an object instantiates these properties in the urban regions; it only follows that such an object instantiates these properties in a region and, in the case of the existent golden mountain, it instantiates them in a suburban region. In other words, from the new item theory, it does not follow that there is an existent golden mountain in the actual world, but it does follow that there is an existent golden mountain in a possible world. And this is why it is not true that, given an unrestricted characterization postulate, logical and ontological triviality follows.

[1] Wildman and Folde 2017.
[2] Sylvan 1995a.

Conclusion

In this paper, we have presented how Routley wanted to develop his item-theory. In the first part of this work, we have summarized the ideas presented in *Exploring Meinong's Jungle and Beyond*. As a case study, we have considered the most basic version of Routley's theory, namely the so-called *Minimal Noneism*. After that, we have shown why Routley was unhappy with it, analyzing two different kinds of issues, namely stylistic and philosophical issues. Finally, we have discussed how he tried to revise his own theory in order to improve it.

Since the development of item-theory analyzed in this paper is simply sketched by Routley and no precise or definite conclusions are drawn, a lot of problems remain open. For instance, how shall we formally deal with this new version of item-theory? Can we have a formal semantics that is able to faithfully represent Routley's new intuitions? Moreover, Graham Priest has already developed a semantics of possible and impossible worlds in order to do justice to Meinong's ontology. Can Priest's modal meinongianism reflect all the ideas sketched by Routley in his archival material? If not, why? All these questions need to be addressed in future works. And this is the real inheritance from Routley, namely, living thoughts that need our contributions to be developed.

References

$EMJB_1$ Routley, R., *Exploring Meinong's Jungle and Beyond*, Research School of Social Sciences, Australian National University, 1980.

$EMJB_2$ Routley, R. et al., *The Sylvan Jungle*, edited by M. Eckert et al., vol. 1–4, Springer Verlag, Berlin, forthcoming.

Berto, F., *Existence as a Real Property. The Ontology of Meinongianism*, Springer, London, 2013.

Chisholm, R., ed., *Realism and the Background of Phenomenology*, The Free Press, Glencoe, Ill., 1960.

Meinong, A., "The theory of objects" (1904). translated by I. Levi, D. B. Terrell, and R. M. Chisholm in Chisholm 1960, 76–117.

Parsons, T., *Nonexistent Objects*, Yale University Press, New Haven, Conn., 1980.

Priest, G., *Towards Non-Being. The Logic and Metaphysics of Intentionality*, Oxford University Press, Oxford, 2005.

Routley, R., "Some Things Do Not Exist", *Notre Dame Journal of Formal Logic* **7** (1966) 251–276.

Routley, R., "Ultralogic as Universal", *Relevance Logic Newsletter* **2** (1977) 50–90.

Routley, R., Meyer, R. K., Plumwood, V. and Brady, R., *Relevant Logics and Their Rivals I. The basic semantical theory*, Ridgeview, California, 1982.

Routley, R. and Routley, V., "The (Logical) Importance of Not Existing", *Dialogue* **18** (1979) 129–165.

Sylvan, R., "A Critique of Deep Ecology", *Discussion Papers in Environmental Philosophy* **12** (1985).

Sylvan, R., "Item-Theory further liberalized", unpublished typescript, Sylvan Papers, folder #1234, Fryer Library, University of Queensland, 1995a.

Sylvan, R., "Item Theory Made Easy", unpublished typescript, Sylvan Papers, folder #1234, Fryer Library, University of Queensland, 1995b.

Sylvan, R., "Item-Theory – Simplified, Streamlined, and Further Applied Structure", unpublished typescript, Sylvan Papers, folder #1234, Fryer Library, University of Queensland, 1995c.

Sylvan, R., "Prologue", unpublished typescript, Sylvan Papers, folder #1234, Fryer Library, University of Queensland, 1995d.

Sylvan, R., *Transcendental Metaphysics: From radical to deep plurallism*, White Horse Press, Cambridge, 1997.

Sylvan, R., *Sociative Logics and Their Applications: Essays by the late Richard Sylvan*, Ashgate, Aldershot, 2000. Edited by D. Hyde and G. Priest.

Wildman, N. and Folde, K., "Fiction Unlimited", *Journal of Aesthetics and Art Criticism* **75** (2017) 73–80.

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https://doi.org/10.1007/978-3-319-78793-0

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