LOGICAL DIALOGUE-GAMES AND FALLACIES

Douglas N. Walton

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LOGICAL DIALOGUE-GAMES AND FALLACIES

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For my parents

CHARLES MITCHELL WALTON

OLIVE HELEN WALTON

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CHAPTER ONE: FALLACIES INTRODUCED

The topic of informal fallacies is a neglected area of scholarship, even despite the irrepressible continued appearance of traditional accounts of the fallacies in logic texts today. What we are sadly confronted with is what Hamblin (1970) all too accurately describes as The Standard Treatment--a dusty collection of anecdotes, puns, and homely but often argumentationally unrealistic illustrations mainly taken verbatim (if sometimes inaccurately) from Aristotle. It is not hard to see how this state of neglect has historically arisen. Formal logicians have tended to think the fallacies a touch too practical, even psychological in nature, less proper to logic but perhaps belonging more in the subject areas of rhetoric, persuasion, or propaganda. And then, since the establishment of mathematical logic, logicians have been, quite correctly, concerned to avoid the unfavorable climate of psychologism that typified the nineteenth century preoccupations with "laws of thought," in favor of the cleaner air of mathematical precision. On the other hand, psychologists, sociologists and political scientists have usually felt the fallacies a touch too "logical" for them to be too heavily involved in, given that a fallacy is not only a psychological or sociological belief-shift or bit of interpersonal persuasion, but an incorrect (or in some sense invalid) argument.

Thus the fallacies have occupied a twilight zone of neglect.

Nonetheless, the usefulness of the study of informal fallacies to the practice of teaching and studying philosophy is apparent. Students often exhibit an initial lively interest in the fallacies. The problem is that it soon becomes apparent that, even with the laboratory specimens of the texts, it is virtually impossible to process or defend classification of the type of arguments associated with the fallacies into <u>correct</u> and <u>fallacious</u> cases. Some fallacies seem to have near-analogous cohorts whose incorrectness is disputable. As Hamblin (1970) repeatedly notes in his discussion of The Standard Treatment, even the traditional examples cited as paradigms of fallacies in the texts too often turn out to be questionable in regard to their genuine fallaciousness. The lack of decision procedures betokens a general <u>lacuna</u> of theory of argument appropriate to the fallacies, as they have traditionally been presented.

We are confronted in this area by the general question: What is an <u>argument</u>? The usual departure point here is the framework of deductive logic. Formally, an argument in deductive logic is a set of propositions (statements). Less formally, one of this set is designated the "conclusion" of the argument, the remainder its "premisses". Then an argument is valid (deductively correct) if and only if it is

not logically possible for the premisses to be true and the conclusion false. As we will see however, this definition turns out to be at once too narrow and too wide to accommodate the fallacies as arguments that are incorrect.

A broader model of argument is that of the logical dialogue-game. In this framework, an argument may be thought of as a set of locutions (including statements, questions, and perhaps other locutions). But each locution is indexed to a participant in the game, where the participant can advance a locution only according to certain rules of the dialogue. A certain subset of the fallacies in fact seem to respond dramatically well to study in this dialogue (or dialectical, as it is often called) framework. Others may respond as well, but seem less central to the inner workings of the dialectical enterprise.

Our intuitions are often strongest when we come down from the abstract notion of argument generally to each of the informal fallacies themselves. What we do have here for practical <u>data</u> is at least a corpus of standard examples or "laboratory specimens" that have proved their practical worth through their use in centuries of use in logic manuals and texts, even if, needless to say, they can never be taken at face value. The task is to plumb each specimen for its essential fallaciousness with the goal of uncovering useful general lessons and workable fragments of dialogical

structure. The other inseparable task is to merge this practical information into some overall theory of games of dialogue.

Choosing ten or so of the traditional fallacies (depending on how you divide them up) as of central interest, our objective will be to bring out their main contours within the theory of logical dialogues. At the same time, the exercise will advance the study of logical dialogues itself, both as a theoretical and practical subject. Without further ado, we must introduce the reader to these fallacies.

1.1 Ad Hominem Arguments

A strategem often resorted to in disputation when an arguer cannot see how to refute evidence brought forward by an opponent consists in attacking the opponent instead of even trying to contend with the evidence. This type of argument, traditionally called ad hominem (against the man), can take several forms. One form, usually called the abusive ad hominem consists in direct personal attack or "character assassination". Another, the circumstantial ad hominem consists in the allegation that some circumstances related to the arguer's situation somewhat defeat or impugn his argument. Quite often the cited circumstance may be an action of the opponent's, the claim being that he "doesn't

practise what he preaches." For example, suppose a parent cites evidence of links between smoking and chronic lung disease, arguing that smoking is unhealthy, therefore his teenage son should not smoke. Son replies "But you smoke a pack every day yourself. So much for your argument against smoking." Son dismisses father's argument as circumstantially inconsistent with his father's own practice. Ad hominem disputes of this sort are not too easy to sort out. Who is committing a fallacy, the father or the son?

To begin to sort out this particular example, we first need to observe that the father's cited evidence linking smoking and lung disease may be worthwhile. Insofar as the son has not rebutted this evidence, he is incorrect or at least too hasty in rejecting this part of the argument for the conclusion that smoking is unhealthy. However, the son is correct to question his father's personal advocacy of the argument for concluding that anyone should not smoke (if that is his conclusion), on the grounds that the father's own practice conflicts with his advice. In short, both the father's and the son's arguments are highly vulnerable to reasonable criticisms, depending on how we clarify the dispute in order to determine what precisely the argument of each participant is.

The more usual approach to logic taking an argument as a given set of propositions (statements),[1] the premisses

and conclusion, is not all that seems to be needed in order to evaluate ad hominem disputes. For in the example above, the question of whether there is or is not a fallacy on the part of this or that disputant would appear to turn on what is the conclusion of the argument relative to the position of, first, the one participant, and then the other. It is in the interpersonal relation of the dispute between the two parties that the analysis of correctness or incorrectness comes out, not just in the propositions themselves apart from who is advocating them or attributing them to whom. Moreover, in order to sort out the argument, we need to take seriously the presumption that the circumstances of the arguer, in this case certain practices or actions of the father, can be a part of the argument itself. The son's claim is that the father's practice is inconsistent with the propositions advanced in his argument. It seems then that most favourably interpreted, the son is not claiming that the propositions in his father's argument are internally logically inconsistent, but rather that some of these propositions are not consistent with the father's action. However this sort of action-theoretic inconsistency is to be analyzed, it is certainly something that should be distinguished from logical inconsistency of propositions in the narrower sense familiarly treated in logic textbooks. Certainly our actions sometimes express propositions or commit

us to certain propositions, even our non-verbal actions that is.[2] But it is by no means clear just how they do, nor are the precise extent or nature of such commitments matters that can be taken for granted.

A much better way to approach cases of ad hominem disputes is to take them as two-person interchanges or moves of argument. First, one participant attacks his opponent by making an allegation of circumstantial weakness in the opponent's argument. The opponent may then choose to try to refute the attack, or to clarify his own position.

In adjudicating on ad hominem arguments it is necessary to arrive at a fair decision on what should properly count as belonging to the position of an arguer. We may define the position of a disputant or the set of propositions that constitute his commitments in the dispute. Strictly speaking, a disputant's commitment-set constitutes the set of propositions he has assented to in answer to the questioning of his opponent in the argument. However, in practice the commitment-set of an arguer is often defined more widely. We saw, for example, that in the practice of argumentation one's actions often serve somehow to express certain commitments that are taken to indicate part of one's position.

In the practice of disputations, what is or is not to be taken as part of an arguer's position may itself be

subject to dispute. Consider the following ad hominem argument: "You of all people should agree that abortion is wrong. After all, you're a Catholic." Presuming that the person to whom this argument is addressed accepts the proposition that he is a Catholic, but not the thesis that abortion is wrong, he seems caught in circumstantial inconsistency. The allegation, at any rate, is that somehow his position is illogical when taken as a whole. Should we say then that he is fairly refuted? Of course he may back off at this point and if his opponent will permit it, retract one or the other of the two propositions. But if not, does logic force his refutation?

Most of us would think that he is in a theologically tight situation. But for his argument to be strongly refuted, it would be necessary to spell out the set of propositions that make one a Catholic, or at least enough of this set to imply that abortion is wrong. However, in practical disputations, even a presumptive inconsistency of this sort would carry enough weight to weakly refute or impugn an opponent's argument by making it questionable.

One has to be extremely careful in evaluating ad hominem attacks however. Although Catholicism may in certain respects be a fairly well-defined position, Catholics may well disagree on some moral or theological propositions. In many cases however, positions may not even be this

clearly defined. Smith, the Leninist, and Jones, the Trotskyite, may both be Marxists, yet their political positions may admit of severe and fundamental differences. Black and White may both be committed feminists, yet flatly disagree on the issue of whether children need a male role model. Hence if Black, an avowed feminist, argues that children need a male role model, she is in no sense properly refuted by an allegation of inconsistency. To make such an ad hominem (or ad feminam) attack into a refutation, it needs to be spelled out just what the position of "feminism" commits her to in relation to the topic of children needing male role models.

So we can see how some ad hominem allegations are based on such thin and poorly documented attributions of "position" that they are little more than vicious and unsubstantiated personal attacks. Mrs. Lorraine Smith is the attorney who took on the case of Michael Watene, a former patient in Auckland's troubled Oakley Hospital who was found dead in his cell after electroconvulsive therapy. Previous to her taking this case, she had done research on mental health legislation as part of her thesis when she had been a student. At that time, the university law school was approached by a Citizen's Commission on Human Rights, backed by Scientology, to find a student to research mental health legislation. This Scientology-backed Commission had been

conducting a campaign against certain aspects of psychiatric treatment in mental hospitals. After taking on the controversial Watene case however, Mrs. Smith reported that "the Scientology connection is at present being used by some people at Oakley to attempt to discredit her. She wants it emphasized that she is not a stirrer and not a Scientologist. She belongs to the Church of Christ, Life and Advent which she says is so conservative women are not allowed to speak at meetings."[3] The difficulty confronted by Mrs. Smith is that because there is some connection, possibly a very tenuous and accidental one, between the ideological position of Scientology and her work on mental health, she may be tarred by an ad hominem brush. People connected with the case she is currently advocating may in fact be led by her opponent's publicizing this connection to infer that she is committed to the ideals of Scientology. This inference is quite likely to be a strong detriment in public opinion, and may strongly undermine her credibility as a fair-minded advocate of reform in mental health legislation. The problem is that even the most tenuous connection to some controversial body of beliefs of commitments may have a "smear" effect. The most badly mounted and documented ad hominem attack can sometimes have a rhetorical impact far beyond sober logical justification.

Connections linking some circumstance of possible

positional significance to someone's argument may in some instances have to be examined with much careful questioning in evaluating ad hominem arguments. For example, suppose a student accuses a businessman of selling weapons to countries that use the arms to kill innocent people. Suppose then that the businessman points out that the university attended by this student has investments in the very same companies that manufacture these weapons. He retorts to the student, "You too (tu quoque)--your argument is hypocritical because your own position is inconsistent. Your hands aren't clean either!" In adjudicating on this dispute between the student and the businessman we have to go into the details of the student's connection with the alleged companies and ultimate use of their products to attempt to determine the seriousness of the alleged inconsistency. We must remember that there is a difference between the propositions 'a sells weapons' and 'a is a member of an institution that invests in the manufacture of weapons'. To condemn one activity while being committed to engaging in the other is not in itself directly inconsistent. However, in the present instance, it is alleged that there is a significant connection between the two activities. Evidently then there are some grounds for thinking that further questioning of the student may reveal some inconsistency of position.

Too often, however, the merest suggestion of some

detracting position or circumstances of personal import is enough to influence the uncritical or uninformed audience to yield to a fallacious inference that an argument is refuted. But there are several ways that the ad hominem attack can fail to be a successful refutation of an argument. Sometimes the alleged inconsistency of commitments is never demonstrated at all, but only alleged in the absence of the victim's denial. Other times, as we saw in the smoking example, a genuine positional inconsistency may be shown, but the wrong conclusion may be drawn from what is shown.

Hence we can see how an ad hominem attack can be fallacious as an argument. Nevertheless, in some instances an ad hominem refutation can be a correct mode of argument. For if someone's position contains an internal inconstency, it cannot be correct as a whole, and it is quite legitimate for a critic to point out the inconsistency. If he truly demonstrates such an inconsistency, his opponent's position is successfully refuted.

1.2 Question-Begging Arguments

We remember that in deductive logic an argument is valid if it is impossible for the premisses to be true and the conclusion false. Hence the reflexive argument form

'p, therefore p' must always be valid. For certainly in classical logic it is impossible for p to be true and false at the same time. However, an argument like 'Wellington is the capital of New Zealand, therefore Wellington is the capital of New Zealand' seems peculiar, even though it is deductively valid. Indeed, some would say that such an argument is circular or question-begging, and therefore fallacious. If so, however, we are faced with a difficulty--the very same argument is both valid and fallacious. Is that a contradiction, or is there something more to argument non-fallaciousness other than validity?

This "something other" in the case of the argument above about Wellington might lie in the requirement that the premiss of an argument should be somehow "different from" or "removed from" the conclusion. Furnishing a premiss by just repeating the conclusion over again is very safe as a deduction, but does not present the person to whom the argument is addressed with independent or new reasons for accepting the conclusion. But these notions of newness or independence do not seem familiar or congenial in the usual framework of classical deductive logic. Is there another context in which they might make more sense?

Suppose we think of an argument as a two-person game of disputation where each participant has his or her thesis to prove. If the game is more along the lines of a dispute rather than a cooperative endeavour, the two theses of the

players might be expected to be quite different, perhaps even inconsistent with each other. In such a contestive disputation, neither player wants to concede his opponent's thesis. And, in fact, the winner of the game will be the one who forces his opponent, by the rules of questioning and answering, to concede the thesis of the opposing player or fall into contradiction.

Imagine a game where Bruce has to prove the proposition 'Plato is black' and Alice has to prove the proposition 'Socrates is white'. Yet both have previously committed themselves to the proposition 'Socrates is the same colour as Plato'. Clearly, if either accepts the opponent's thesis he(she) loses the game. For example, if Alice asks Bruce to accept her thesis 'Socrates is white', and Bruce foolishly agrees, then Bruce is at once committed to all three propositions, which are of course collectively inconsistent. So Bruce immediately loses the game.

In such a case, Alice is supposed to argue for the thesis 'Socrates is white'. By making as her move the attempt to get Bruce to directly assent to this very proposition she is in effect arguing 'Socrates is white, therefore Socrates is white'. Her strategy is a purely circular move to dupe poor Bruce into contradiction without doing the work necessary to win over a more alert or astute player. No astute player would of course directly accept

his opponent's thesis. In a sense then, Alice has no right to directly demand her thesis, for that is the very question at issue.

Perhaps we can now understand the sense of the apparently peculiar phrase "begging the question".[4] Alice should be proving her thesis by deducing it from some other propositions conceded by Bruce, not merely "begging" for his acceptance of her thesis by presenting it point-blank. As strategies go, begging for the question is the least sophisticated play possible. It would only fool the most obtuse possible opponent. Perhaps therefore it ought to be banned altogether as a legitimate move. Concessions leading an opponent towards a player's thesis should be far enough removed (independent of the thesis) so that a moderately astute opponent might be inclined to accept them.

Such notions of "removal", "newness", or "independence" of premisses and conclusion begin to make sense in the context of a logical game of disputation, but are still not entirely clear.

It is not only reflexivity of inferences that occasions criticisms of circularity, but sometimes symmetry of inference as well. If an inference 'p therefore q' is advanced in the context of the same argument as the inference 'q therefore p', the argument as a whole may be criticized as circular. But again, purely from a viewpoint of

classical logic there need be nothing wrong with this circular pair of inferences. If q is deducible from p and p is deducible from q, then all that is shown as far as deductive logic is concerned is that p is equivalent to q. And there is nothing fallacious per se in proving that two propositions are equivalent.

However, sometimes in practice a symmetrical pair of inferences does indicate a fallacious line of argument. According to an anecdote, an efficiency expert visiting a factory was informed that the employees knew when to return after lunch because a gun was fired by a man on the roof at precisely one o'clock. When asked how he knew it was one o'clock, the man on the roof said that he checked the clock outside the store across the street. The efficiency expert then went to the store and asked the proprieter how often he checked the clock outside his store, and got the reply, "Never. It's always dead right by the one o'clock gun." The fallacy here is their circular reliance upon each other instead of anyone consulting an independent source of information that is more likely to be accurate.

Other practical cases suggest that it is not so clear that arguing in a circular pattern is absolutely incorrect or fallacious. Suppose two lamps are identically wired so that each is fired by a light-sensitive cell when a sufficient amount of light reaches the cell and triggers the switch.

Then we bring each lamp adjacent to the other cell and start a process of both lamps alternately flashing in sequence. Now consider the following bit of dialogue.

BLACK: Why does light A light up?

WHITE: If another lamp close to it is lit, it will light. And lamp B is close to it and lit.

BLACK: Why does lamp B light up?

WHITE: If another lamp close to it is lit, it will light. And lamp A is close to it and lit.

In this instance, White's argument as a whole is circular. But it is not clear that it is fallacious, or even that there is anything too badly wrong with it. The feedback process of the sequence of flashing lights is circular, and therefore it seems appropriate that White's explanation of it should be circular as well.

More complex examples of circular reasoning sometimes occur in the social sciences, and are not regarded as fallacious. Consider this dialogue.

BLACK: Why is the building trade in such a slump in Manitoba?

WHITE: Well, a lot of people are leaving the province, and there isn't such a need for houses and so forth because of the depleted population.

BLACK: But why are so many people leaving the province?

WHITE: Well, the economic situation is not favourable--there just aren't enough jobs. Business is in a slump generally.

BLACK: Does that include the building trade as well?

WHITE: Of course.

Here White has gone in a circle. But is the circle fallacious, or is it rather that the economic situation itself runs in a feed-back network of cycles? Because the building trade is in a slump, people leave the province. But as more people leave the province, the slump in the building trade is worsened.

Whatever we are to say about these circular arguments, it is at any rate not clear that they are absolutely fallacious. Hence the questions are posed: What is wrong with arguing in a circle, and when is it fallacious?

1.3 Argument from Ignorance

It is often pointed out to students of scientific method that there is a critical difference between a hypothesis that is disconfirmed and one that is merely unconfirmed. Because there is no relevant data yet, or because

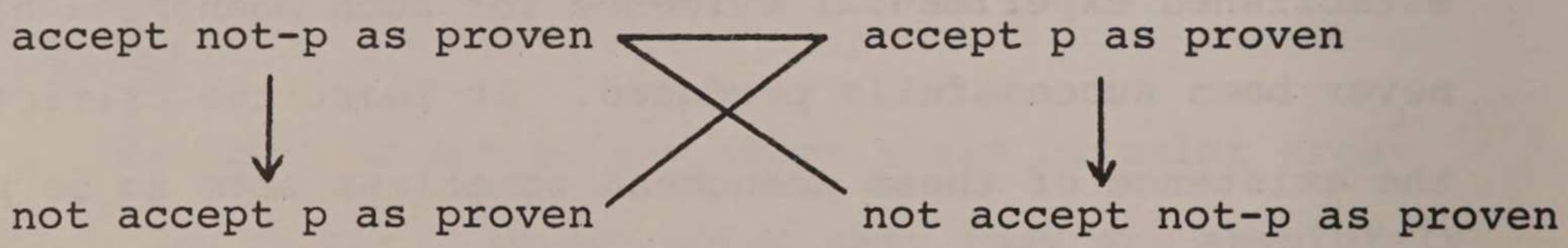
a hypothesis has been only very weakly confirmed by the data, that does not mean the hypothesis should be rejected or altogether discounted in every case. Absence of experimental support for a claim is different from positive evidence against it. Hence we are warned about fallaciously arguing from ignorance (ad ignorantiam) to the positive knowledge that some claim or theory is false or disconfirmed.

It seems especially easy to commit the fallacy of arguing from ignorance where there are very little data, or where there may be some reason to think that there are no data at all. For example, it seems easy to deny the existence of paranormal psychological phemonena like extrasensory perception on the basis that conclusive or well-established experimental evidence for such phenomena has never been successfully produced. At least the critics of the existence of these phenomena sometimes seem to be presenting or acquiescing in this form of ad ignorantiam argument in order to reject paranormal hypotheses.

The danger of this form of argument is that if you try very hard to prove something and fail, it doesn't necessarily follow that what you tried to prove is false. For example, in mathematics you can sometimes prove that some conjecture cannot be proven, even though previously you did not know whether it could be proved or not, and perhaps suspected that it was just very difficult to prove. Some

incompleteness results in logic are of this sort. Thus there is a crucial difference between showing that some claim has never in fact been proven, and showing that it cannot be proved. Arguing from the failure of proof to the necessary failure of any proof is a form of modal fallacy, analogous to arguing from the premiss that p is possibly false to the conclusion that p is necessarily false.

In evaluating ad ignorantiam arguments it is useful to keep in mind the distinction between not accepting a proposition and accepting the negation of that proposition. On the square of opposition below, the arrows indicate implications and the lines without arrows indicate inconsistency.



The fallacy may occur in arguing the other way along each of the arrows. Because you do not accept p, it need not follow that you must accept not-p. Similarly, if you do not accept not-p it need not follow that you have to accept p. For example, if you do not accept the proven non-existence of God--let's say you are not an outright atheist but more of an agnostic--it does not follow that you must accept the existence of God as proven. If you could prove, as St.

Anselm thought he did, that the atheist's claim of the non-existence of God can never be proven because it is actually an inconsistent claim, then you would have to accept the existence of God as proven. This is a form of indirect proof by showing that the contrary supposition leads to absurdity or contradiction, and quite a different thing. Just because your opponent in theological disputation has failed to prove the existence of God, it is not warranted to conclude that he can't prove it, or that you have disproved that it can be proven.

Although it may seem clear enough what the fallacy essentially consists in here, the problem is that arguing to a negative conclusion on the basis of lack of evidence is sometimes non-fallacious, especially in induction and statistics. Suppose you have a barrel full of marbles and you have good reason to believe that each marble is one solid colour and that the marbles are mixed up in a homogeneous or random way with respect to colour. You take out a large handful of marbles and find that there are no green marbles in it. On the basis of the lack of green marbles found in the handful, statisticians tell us that the hypothesis that there are no green marbles in the barrel is confirmed to a certain degree or probability. If our standards of acceptance are not too high, we might even be justified in accepting the hypothesis that there are no green marbles in the barrel. Of course, that acceptance would be provisional or probabilistic in

nature, rather than conclusive. Even so, we do seem to be arguing in a way that has the form of an ad ignorantiam argument when we reason: we have not found a green marble in the barrel, therefore the proposition that there is a green marble in the barrel is (probably) false. Indeed, if we examined the colour of every marble in the barrel and found no green ones at all, we might reason much more confidently: we have not found a green marble in the barrel, therefore the proposition that there is a green marble in the barrel is false. Surely in either of these cases we are doing something that looks very much like arguing from ignorance--just like the fallacious examples previously given--except that in these cases the argument does not appear to commit an ad ignorantiam fallacy. Here it seems that the absence of evidence for the claim 'There is a green marble in the barrel' should count as legitimate grounds for denying that it is true.

A lot depends on how you describe the appropriate steps in the reasoning above, however. Perhaps when we look at the handful and find no green marbles in it this is more than just absence of evidence for the proposition 'There is a green marble in the barrel', but positive evidence for the proposition 'There are no green marbles in the barrel'. If so, concluding positively that there are no green marbles in the barrel is not fallacious at all. So construed, we are

not making a fallacious inference from not accepting p as proven to accepting not-p as proven (in the handful) to accepting not-p as proven, or at least made likely (in the whole barrel). This form of inference is generally accepted by statisticians, subject to important qualifications of different sorts, and is by no means fallacious in itself.

Another context where what seems like ad ignorantiam reasoning is non-fallacious is that of reasonable presumption for accepting something in the face of lack of definite information. If someone hands you a gun and you don't know whether it is loaded or not, it is better to presume that it is loaded. Despite the reasonableness of such an inference, it looks very much as though it could be fairly described as follows: I don't accept that the weapon is unloaded, wanting to be on the safe side, therefore I conclude to accepting the presumption that the gun is loaded. This inference strongly appears to have the form of the inference going backwards along the arrow on the right side of the square of opposition above. Yet we remember that such a form of inference represents a fallacious ad ignorantiam argument.

Examples of plausible reasoning where inferences are reasonable to presume, even where they are neither deductively sound nor inductively strong, are common where there is a need to make decisions with lack of decisive information. For example, criminal law usually presumes innocence until

guilt is proven, as a matter of policy. As it is said, the burden of proof is on the prosecution to prove guilt. The defence merely has to show reasonable doubt. Lack of any definite evidence does then count in this context as proving innocence. If the court does not accept guilt as proven, then it does accept innocence as proven, thereby apparently committing an ad ignorantiam inference of the sort we indicated on the square of opposition as being fallacious.

1.4 Irrelevant Conclusion

Sometimes a fallacy occurs where a valid argument is given, but does not prove the conclusion which is actually in question. Such an argument misses the point it was supposed to establish, yet this failure may be easily overlooked if the argument is in itself deductively correct. For example, a prosecuting attorney may argue that a murder was a particularly horrible crime, showing the victim's bloodstained clothes and other gruesome pieces of evidence. Thus emotionally distracted, the jury may overlook his total failure to give any evidence that the defendant was the murderer. Perhaps the prosecutor may have constructed quite a good argument to show that this murder was a horrible crime. Yet his argument as a whole may be considerably less compelling when we clearly realize that he was supposed to

prove the defendant's guilt in respect to this crime.

The fallacy involved in arguing to an irrelevant conclusion seems to be external to the usual concerns of deductive logic. For even though an argument commits this fallacy, it may still be deductively valid by itself. The problem is that the larger argument, of which this deductively valid argument is a sub-argument, may be missing steps or wholly lacking other than the one small part.

Suppose Bruce and Alice are disputing the issue of whether the death penalty is immoral, Bruce arguing for the affirmative and Alice taking the side to argue that the death penalty is not immoral. At one point Bruce launches into a long statistical argument designed to prove to Alice and all listening that the death penalty is not an effective deterrent to the crime of murder. Finding Alice temporarily silenced by his impressive list of facts, Bruce concludes that the argument is settled in his favour. A critical listener might at this point observe that Bruce has failed to prove his point unless he also proves another proposition: if the death penalty is not an effective deterrent then the death penalty is immoral.

Let us say then that Bruce has proved that if some facts obtain (A) then the death penalty is not a deterrent (B). And let's also say he has proved A to everyone's satisfaction. His argument so far takes the valid form 'A ⊃ B, A,

therefore B'. However, he is supposed to prove that the death penalty is immoral (C). So if you look at his argument as a whole, it has the form '((A ⊃ B) ∧ A) ⊃ B, therefore C' which is not a valid form of argument. The part before 'therefore' is in a valid form of argument. The part before 'therefore' is in a sense "irrelevant" to the conclusion C, meaning that it doesn't prove it at all. Bruce has argued validly, at least up to a point, yet failed to establish the conclusion he was supposed to prove.

What could be meant by saying that Bruce's argument was irrelevant to the conclusion he was supposed to prove? Certainly the argument he did validly prove was not irrelevant in the sense that its subject-matter was entirely unrelated to the conclusion that the death penalty is also about the topic of the death penalty. 'Irrelevant' just seems to mean 'invalid'. But an irrelevant argument in the required sense is not just any invalid argument whatever. For example, 'A ⊃ C, ¬A, therefore C' is invalid but would not seem to be "irrelevant" in the sense of arguing to an irrelevant conclusion.

A clue is found in Aristotle's name for this fallacy as <u>ignoratio elenchi</u> (ignorance of refutation). Bruce's argument was valid but the problem was that it failed to establish C, the conclusion he was set to prove in the dispute with Alice. That is, Bruce's argument was valid as far as it went, but it failed to refute Alice's thesis ¬C. And

to win the dispute, Bruce must produce a correct argument sufficient to refute Alice's thesis. Here is the fallacy then--there was ignorance of refutation only, and not genuine refutation of his opponent's thesis. Bruce only thought he had refuted Alice, or at least wanted the audience and Alice to think so. But looked at over-all, his refutation was lacking. To see the fallacy, you have to view the argument with an eye to its ultimate objective in the context of the issue in contention.

1.5 Complex Questions

It may be somewhat discouraging to learn that one need not even venture to assert a proposition to get involved in fallacy--merely asking a question can sometimes run the risk of error or misadventure. Questions have presuppositions and can therefore sometimes be much less innocent or harmless, when one tries to answer, than any mere query should have a right to be. Probably the most famous offender in this regard is the question "Have you stopped beating your spouse?" No matter which way the poor non-spouse-beater answers, he or she stands convicted of having at some time or other engaged in spouse-beating. 'Yes' implies that while you have now stopped, you used to do so at some previous time. 'No' implies that you are still doing it.

Of course, those of us who have no wish to freely admit ~~to~~ the practice of spousal abuse will not answer the question 'yes' or 'no', but insist that it be reformulated or "answer" it in some oblique way, e.g. "No, I have never beaten my spouse in the past, nor am I doing so currently!" Clearly, however, the intent of phrasing the question precisely the way it is calls for an incriminating 'yes' or 'no' rather than one of these escape-routes. Of course, in most conversations one has the liberty of reformulating, refusing to answer, or otherwise fiddling around with the question. But in a legal proceeding or multiple-choice examination, questions sometimes seem intriguingly similar to the spouse-beating one without leaving the answerer the luxury of opting out. Even where one can opt out, it would be nice to know the best way to do it, and also to understand precisely what is fallacious about questions like this.

One of the first things to notice is that not every question that has a presupposition is fallacious. For example, "Is chlorine green?" has a presupposition that chlorine is a substance that admits of the property of being coloured, but there is normally nothing fallacious about the question. You can answer 'yes' or 'no' with no feeling of being abused by the question itself.

Moreover, not every complex question--one that has

multiple presuppositions--need be fallacious. "What is a green gas that is poisonous to man?" is a complex but evidently non-fallacious question. "Is she wearing the beret or the leather helmet?" is a question that has a disjunctive presupposition, but there need be nothing fallacious about asking it, just because the presupposition is complex. In some situations we can answer this sort of question without finding it a problem.

Other complex questions pose difficulties. If you try to answer "Are you in favour of both equal opportunity and genocide or neither?" with either a 'yes' or 'no', you commit yourself to (a) both, or (b) neither. What one wants is a way of separating the question into two. The complex presupposition that you support both or neither is likely to be a problem for most answerers.

A different kind of problem is posed by "Is a zebra black or white?" The disjunction seems to be exclusive, calling for exactly one of the answers 'Black' or 'White', but not both.

The general problem seems to be that yes-no questions with multiple presuppositions tend to restrict the answerer, perhaps unfairly, to some proper subset of all the possible combinations of propositions that could make up an answer. For example, suppose a complex yes-no question has two presuppositions A and B. Then there are

many possible combinations of propositions that could make up an answer. For example, suppose a complex yes-no question has two presuppositions A and B, and the following possible answers.

$$A \wedge B, \quad A \wedge \neg B, \quad \neg A \wedge B, \quad \neg A \wedge \neg B, \quad \neg(A \wedge B), \ldots$$

The "equal opportunity" question forces you to choose exclusively between the first combination (yes) and the fourth (no). Whereas it should leave you, for example, the second possibility open. The "zebra" question forces you to choose exclusively between the second combination (black but not white) and the third (white but not black). Whereas it should leave you, for example, the first possibility open. The problem then is that the combination of multiple presuppositions and yes-no questions can sometimes force an answerer into an unfairly restricted set of alternatives left open.

The fact that it is complex is not the only objectionable thing about the spouse-beating question however. There is another problem. No matter how you sort out the possible combinations of propositions that could make up an answer, the answerer is still unfairly restricted, even if all these combinations are allowed. Let W stand for 'You have a spouse whom you have beaten' and let S stand for 'You have not stopped (beating this spouse).' Then no matter how you spell out all the possible combinations of answers,

$$W \wedge S, \quad W \wedge \neg S, \quad \neg W \wedge S, \quad \neg W \wedge \neg S, \quad \neg(W \wedge S), \ldots,$$

you are going to be in trouble whichever answer you select. For every one of these possible combinations by itself implies that you have a spouse that you have at some time or other beaten. Each implies a proposition that you reject as false, or at least that you are not likely to want to accept (unless you are a frankly acknowledged spouse-beater and don't mind admitting it).

So here is a second, quite separate problem with the spouse-beating question--it forces the answerer to commit himself to some proposition that is unwelcome to him (meaning that he would not normally want to commit himself to it if given a choice) no matter which truth-functional combination of presuppositions is allowed as an answer. Hence the spouse-beating question has a double element of 'forcing' built into its answering-range of options. It is not only a complex question but also a loaded question in the sense that every possible alternative has an unwelcome implication.

Clearly then, the fact that questions have significant presuppositions leaves them open to mischief of various sorts in the very asking. Yet another type of questionable question is the meaningless question, e.g., "Is zero an even or odd integer?" What is wrong here is that the presupposition 'Zero is an even integer or zero is an odd integer' fails to have any truth-value at all. It is neither true nor false. Curiously, in this case the presupposition of

the question (the last disjunction above), itself has a presupposition.

We are suggesting then that questions can be fallacious. But this suggestion is somewhat paradoxical in light of some longstanding traditions of logic. One tradition is expressed in the thesis that a fallacy is a fallacious argument. Now just as propositions take on the properties of being true or false, arguments take on the properties of being valid or invalid. This suggests a second, more controversial thesis: all fallacious arguments are invalid. This thesis is so controversial because so much depends on what you mean by invalid. You could mean 'invalid in some particular system of classical logic', 'invalid in (any) classical logic', 'invalid in some logic or other', e.g. perhaps a non-classical logic like the intuitionistic logic, 'incorrect, but not necessarily invalid in relation to any formal system of logic', or any of a number of other possibilities. Although the precise relationship between fallaciousness and invalidity is very controversial, presumably it is because of some such connection that the notion of fallacy makes sense. A fallacy is an argument that is justifiably open to criticism because it represents a falling short of some ideal or principle of correct argument. It is a logical failure and not merely a breach of manners, ethical standards, or commendable

psychological ploy to persuade someone to do what you want.

But a question is not an argument. Then in light of the preceding paragraph, how can we justifiably say that asking a question can commit a fallacy? Does the notion of a "fallacious question" make any sense? The answer to this question must somehow lie in the important fact that questions have presuppositions. Thus asking a question is an act that is not empty of assertoric content--thus while asking is not arguing to one conclusion, it is nevertheless leading the answerer towards a conclusion by restricting the answerer's alternatives in a partial way. If asking a question restricts the set of possible answers too sharply, in a way that gives the questioner an unfair advantage and forces the answerer to flatly contravene his own commitments, it could be a form of question that gives too much power to the questioner and should not be allowed in a fair dispute.

1.6 Appeals to Emotion

A good strategy if you are losing an argument because your opponent has more evidence on his side is to introduce a powerful emotional distraction. One type of emotional appeal is a threat, traditionally called the argumentum ad baculum (appeal to the club): "It's unfortunate that you have chosen to express yourself in such a provocative way. A person who argued in that way last week died in a bomb

explosion when he answered the door." The ad misericordiam or appeal to pity is said to occur, for example, when a defendant in court presents his tearful family in prominent view of the jury. The ad populum or popular appeal is said to have taken place when an arguer appeals to the feelings of a particular audience, for example, the politician addressing an audience of farmers who goes on stressing that he and his wife ran a fruit farm for several years.

What is suspicious about such appeals is that they may be designed to distract from argument. But what is not so clear is whether these types of appeals are themselves arguments. If we adhere to the thesis that a fallacy is a fallacious argument, it becomes questionable whether these suspicious moves are in fact fallacies. If I point a pistol to your head in response to your argument, what statements have I made that constitute my premisses and conclusion? Whatever a threat is in logical terms, it may be more like an imperative, e.g., "Stop, or I'll fire!" than a statement. What propositions does the defendant produce when he presents his tearful family: "My family is in tears, therefore I'm innocent."? Or the farmer-politician, is he really arguing, "I'm a nice guy, so you should vote for me."? If these are their arguments, they are certainly invalid, and there's not much else good to say about them either. But it is by no means clear that these propositions are equivalent to what the man does who appeals to pity or popular sentiment in

these cases.

In short, these "fallacies" may not be fallacies at all, but rather attempts to avoid argument altogether.[5] Avoiding argument may be morally despicable in some instances, even if it is not strictly fallacious.

Another problematic aspect of the various type of emotional appeals we have examined, in regard to their status as fallacies, is that in some instances they would appear to be not incorrect. The legal threat of loss of driving privileges for an offence of drunken driving may not be unreasonable. Charity is a Christian virtue, and therefore a plea for mercy, even if it appeals to pity, need not always be wrong or fallacious. In a democratic society, popular appeal to a majority of constituents is surely not in every instance an absolutely wrong objective in a politician's argument. So even if these appeals are sometimes arguments, it is by no means evident that they are always fallacious arguments.

A type of argument called <u>practical reasoning</u> takes the following form: you want to bring about B, but in order to bring about B it is necessary to bring about A, therefore you should bring about A. Called the "practical syllogism" this form of inference would seem to be a generally valid principle for ordering one's priorities in deciding how one should act.[6]

Now the types of emotional appeals we have been considering do appear to bear some resemblance to the practical syllogism form of argument. Consider the practical reasoning analogue of the ad baculum: you want to avoid B (some bad state of affairs), but in order to avoid B it is necessary to bring about A (desist from your argument), therefore you should bring about A. 'Desist from A' or 'Avoid A' is merely a paraphrase for the negation 'You do not bring about A'. An argument of this sort might in many instances be quite reasonable. So what could be fallacious about the ad baculum even if it really is a type of argument?

To get at the problem, we have to try to state what the essential difference between a warning and a threat is. If I offer you the practical argument that you should do something if you want to avoid something else you regard as harmful or wish to avoid, I am giving you a kind of warning. And of course a warning need not be in itself fallacious even if it takes the form of a practical argument. But in the first ad baculum example we looked at, what made for the suggestion of fallaciousness in the air was the feeling that what was said was no mere warning at all, but an ugly threat, full of menace. However sometimes the most innocently pronounced warning can easily convey a subtle, and perhaps therefore all the more effective threat, e.g., "As

party leader I am warning you that if you don't vote my way, somehow you may find yourself in the wrong." Until we can find a good way to make the subtle distinction between a threat and a warning, the ad baculum is likely to remain elusive as a fallacy that can be identified or dealt with.

Another suggestion is that when these emotional appeals are arguments they are fallacious because of some failure of relevance. Perhaps this suggestion is that such failures are instances of arguing to an irrelevant conclusion, or sometimes even so bad as arguments that the conclusion fails to have anything in common by way of subject-matter with the premisses. The suggestion may be that the pitiable display put on by my family really has nothing to do with the question of guilt or innocence.

Note, however, that even if this suggestion should turn out to be correct, we have still not shown why each of the three emotional appeals (threat, pity and popularity) is a distinct form of failure of correct argument. After all, identifying an emotion is a question of psychology, not logic. If so, these three are not separate fallacies in their own right at all, but just different instances of the fallacy of irrelevant conclusion.

1.7 Straw Man Refutations

What is usually called the straw man fallacy is the practice of criticizing an opponent's position or argument while attributing to that opponent an argument or position that is not in fact his. Interestingly, the criticism of the position or argument rebutted could in itself be quite correct. For example, the critic might allege that C, some proposition conceded to be false by all parties to the argument, follows from his opponent's commitments, $(A \wedge B) \supset C$ and $A \wedge B$. The deduction here is deductively valid, but presumably the fallacy, if there is one, lies in the false or questionable attribution of $(A \wedge B) \supset C$ and $A \wedge B$ to the opponent. So as with other fallacies we have looked at, the problem appears to be external to the question of the deductive validity of the argument.

This sort of questionable move can become especially ticklish, as DeMorgan (1847) observed, when there are more than two parties in the dispute. One opponent may be committed to A, another to B, then a third participant may deduce C, some proposition all agree is false, from the conjunction $A \wedge B$, declaring that both his opponents are refuted. Perhaps however the first opponent is committed to $A \wedge \neg B$ and the second to $B \wedge \neg A$. That is, there may be

no guarantee that both share exactly the same position in every respect. By gratuitously making the assumption, the third person commits a form of straw man fallacy.

Perhaps it is unnecessary to stress how common straw man reasoning is in practice, or how rhetorically effective it can be when deployed, for example, in politics where 'position' is most important to refutations. Ernst Hanfstaengl , a one-time crony of Hitler's,observed how the latter's platform technique used powerful appeals to primitive emotions, building up to a crescendo much like the tempo and movement of a symphony. An adroit use of mimicry was also characteristic of a Hitler speech. He would impersonate an imaginary opponent and then attack with a counter-argument, finally "returning to his original line of thought after completely annihilating his supposed adversary."[7] This strategy is a particularly cheap victory if the opponent is not around to protest, and the audience is not so strongly committed to his position that they feel the need to question the fairness of its representation. The orator who can "feel out the audience" can take advantage of his knowledge of their commitments as related to those of the attacked opponent who is absent.

But the straw man phenomenon is equally important in the criticism of written arguments. In any form of written critique of an opponent's position, one begins with a finite

set of statements set down on paper by that opponent--it may be a sentence, paragraph, article, book, or even a set of books and other writings. Naturally enough, however, in criticizing this set of propositions, one will come to junctures where presumptions of one sort or another need to be filled in. An enthymeme is usually defined as a missing premiss, needed to make an argument valid, and which therefore may be "tacitly assumed" to be meant, even though the arguer has not explicitly stated it as such. The problem with enthymemes is that once a critic starts popping them in, who is to say where to shut the gates if the original proposer of the argument now subject to criticism is not around to indicate what he "tacitly assumed" or did not. Giving the critic licence to fill in what he wants does not secure much of a fair guarantee for the writer of the works being criticized.

1.8 Appeals to Authority

There are several basic requirements that must be met for an appeal to the authority of an expert to avoid fallacy. Each of these requirements represents a different way in which such an appeal can fail. One requirement is that the source authority be interpreted correctly. This condition, although it sounds trivial, is nonetheless a

requirement that is in practice quite difficult to meet. The problem is that experts often speak in the technical language of a particular discipline, and therefore it may be in practice quite difficult for an expert to communicate with someone who is a layman in that field. It is also characteristically difficult for two experts in different fields to communicate meaningfully. Therefore, in quoting the sayso of an expert it is quite important that the exact words in which the expert gave testimony be used--or at least as close as possible an approximation be given--so that the expert is not misquoted, and so that subtle changes in wording may be rendered without a misleading effect.

It is also notorious that experts will attach a number of conditions to their pronouncements. In many instances an expert will say, not that such and such will happen unconditionally, but that if certain assumptions are made, some outcome may occur. However, very often in appealing to authorities these conditions are not stated, or even overlooked, and the result can be a disastrous misinterpretation. Omissions of context, for example, preceding or following the quotation from an expert may radically affect the statement.

DeMorgan (1847) noted that there is a common practice of putting the pronouncements of experts together in a fallacious way. For example expert $\mathcal{L}$ may pronounce

conditionally that if A then B. Then expert $\mathcal{B}$ may then come along and claim that in his view A is true. Further, some third party $\mathcal{C}$ may come along and draw the logical consequence B which follows deductively from both of these premisses, claiming that that is a reasonable inference to draw from the pronouncements of these two experts collectively. However, in fact it may be the case that neither expert $\mathcal{A}$ nor expert $\mathcal{B}$ agrees that B because neither agrees with the premiss of the other. Thus as DeMorgan wisely warned, it is a common vice to take one premiss from the individuals of one party, another from others, and to fix the logical conclusion of the two upon the whole party. However, such an inference, while deductively correct, may nevertheless be quite fallacious if the conclusion of the inference is denied by both parties because they disagree with each other's premisses. We could call this the fallacy of collective inference in multiple appeals to authority.

Another requirement is that the authority should actually have special competence in her area of expertise and not simply some superficial prestige or popularity. It may be quite difficult to say what constitutes special competence in a given area and the seriousness of the difficulty depends on the particular field of expertise to which one refers. Obviously such criteria are not nicely

standardized among different fields. Yet perhaps one should take into account factors like previous record of predictions, tests that the purported expert may have undergone, or access to qualifications, degrees or testimony of other colleagues.

A third requirement is that the judgement of the expert must actually be within that special field of confidence. Too often what happens in appeals to expertise is that the expert may be an expert in field F and therefore may have considerable general credibility because of the prestige of this particular field. Yet this legitimate expert may make a pronouncement in field G, which is not very closely related to field F. Because of a certain halo effect from area F, added credibility may be given to this person's judgement in field G simply because he or she is an expert in some area. However, it may be quite difficult to decide whether area F is closely enough related to area G for the expert's judgement in the second area to be accorded much credibility over that of a layperson. Therefore we have to be very careful to recognize that any appeal to expertise in particular fields are highly topic-sensitive.

Yet another requirement is that direct evidence should be available in principle if the expert sayso is challenged. We may presume that for any appeal to expertise

to be adequate and reasonable, the authority should have based his or her judgement on relevant and objective evidence within the area of expertise. Of course with appeals to expertise we ourselves may not have direct access to this evidence.[8]

In fact generally speaking we only appeal to experts, if in fact, it may be too expensive or otherwise difficult for us to have direct evidence. That is why we may legitimately appeal to experts as a secondary source of subjective knowledge when we have to make a decision. However, despite this subjective aspect of the appeal to expertise, the authority should be able to give some objective evidence to back up his or her judgement if queried. That is, we presume that the expert has based his or her judgement on some objective evidence even though this evidence may not be directly accessible to us.

Another problem is that consensus or resolution techniques may be required for ruling on disagreements amongst qualified experts. It is a commonplace fact that experts do disagree and in order to adjudicate on disagreements it would be very useful to have some way of resolving such inconsistencies. Clearly one way to approach this problem would entail dialogue amongst the parties to the disagreement or others involved in trying to arrive at a conclusion on the subject at issue.

Notes: Chapter One

[1]Throughout this monograph, we shall use the terms 'proposition' and 'statement' interchangeably. We mean to refer to entities that take the property of 'true' or 'false'. Therefore a proposition is defined with reference to its truth-conditions. Some discussion of the role of semantics versus pragmatics, including the role of propositions as semantic notions, is given in 4.9.

[2]The question of how actions may be taken to express commitments in argumentation is taken up much more fully in Walton (1983).

[3]Robert Mannion, 'Oakley Hospital and the Death of Michael Watene, Auckland Metro, September, 1982, p. 94.

[4]See also various comments in Hamblin (1970).

[5]Such is the line taken by Woods and Walton (1976).

[6]See von Wright (1968). Questions pertaining to the logic of actions are not treated extensively here, but fuller developments are given in Walton (1983).

[7]Quoted in John Toland, Adolf Hitler, Garden City, N.Y., Doubleday & Co., Inc., 1976, p. 139.

[8]A fuller account of the various conditions to be met by non-fallacious appeals to expertise is given in Woods and Walton (1974).

CHAPTER TWO: LOGICAL DIALOGUE-GAMES

Now we have looked over a few of the traditional fallacies. The ones looked at do indeed seem to represent a catalogue of some interesting and common forms of error in argumentation. And the model of argument as a two or many-person dialogue interchange already seems much more revealing in regard to their ostensible fallaciousness than any narrower model like classical deductive logic could hope to be (by itself).

But is the logic of dialogue enough of a well-founded discipline to carry out the work of analysis needed for these arguments and fallacies? In a word, the answer is 'No.' But several pioneering attempts to construct the outline of a theory of logical dialogue have now been undertaken. They look very promising. Let us review them, or at least their fundamentals, in this chapter. In the course of evaluating these theories, we will at the same time begin to engage some of the fallacies and arguments covered in the last chapter.

In all modesty, we should note that the fallacies covered in the last chapter are merely brief sketches to get the reader into the spirit of our inquiry, or at least introduce her to the fallacies if she has not encountered them yet. A good beginning survey of these fallacies and

more may be found in Copi (1972). Some historical background and interesting comments are to be found in the first chapter of Hamblin (1970). More detailed study specimens and analyses of these and other fallacies are given in Woods and Walton (1982).

Let us begin the study of logical dialogues with the pioneering work of Charles Hamblin.

2.1 Hamblin Formal Dialogues

Hamblin (1970) argues that the best way to study the fallacies is to set up dialectical games (systems) that model discussions or dialogues which are the natural environment and context of fallacies as they have been traditionally conceived. As he sees it, dialectical systems can be pursued descriptively or formally. The descriptive study looks at rules and conventions of real discussions like parliamentary debates or legal cross-examinations. The formal approach involves the construction of simple but precise systems where moves are regulated by rules that can be clearly stated even if they may not necessarily be realistic. These formal systems will then have formal properties that can presumably be compared to interesting sequences of realistic discussions and thereby throw some light on the latter by modelling them.

A Hamblin game of formal dialectic then must involve a set of "players" and "moves" made by these players. A third key ingredient is the commitment-store of each player. Commitments are not beliefs of the players, but operate approximately like the real beliefs of an arguer. However, psychology is not the purpose of constructing Hamblin games, and we are advised to think of a commitment-store, strictly speaking, more along the lines of a set of statements written down by each player on a slate that he possesses. As we will see, the rules of a Hamblin game add to or subtract from the commitment-stores of the players, and how this modification of the stores takes place is the key to modelling the fallacies.

Hamblin considers the requirement that commitment-stores should always be internally consistent (p. 257) but rejects it, at least as a universal requirement on dialectical systems because it is an ideal of 'rational man' not always met with (p. 263). He is also inclined to reject deductive closure of commitment-stores as a universal requirement, but (p. 264) feels that "certain very immediate consequences" of a commitment may also be commitments. Both requirements are matters of "regulation in a given system" (p. 264).

Hamblin (1970, p. 265-8) has designed one particularly basic game we may call (H), with the purposes of

realizing a concept of argument and modelling some of the traditional fallacies. There are two participants, White and Black, who take turns making moves. The types of moves allowed involve the asking and answering of questions. Hamblin (p. 265) formulates five rules that demarcate permissible locutions. Capital letters S, T, U, . . . are variables for statements.

(i) 'Statement S' or, in certain special cases, 'Statements S, T'.

(ii) 'No commitment S, T, . . . X', for any number of statements S, T, . . . X (one or more).

(iii) 'Question S, T, . . ., X?', for any number of statements (one or more).

(iv) 'Why S?', for any statement S other than a substitution-instance of an axiom.

(v) 'Resolve S'.

The language of (H) is propositional calculus, or any other "suitable" system with a finite set of atomic statements. Each participant has a commitment-store, a set of commitments that contains the axioms for the language. There are two types of questions that a player can ask, (iii) or (iv). However Hamblin notes that two simpler games could be built by deleting one or the other of these rules and keeping the remaining four.

The precise import in (H) of each of these five

types of moves is made clear by Hamblin's formulation (1970, p. 266) of sets of permissible 'next moves' for each move above. 'Resolve S' is evidently a way of directly asking the other player to indicate his lack of commitment to a statement or its negation. Responding does not of course commit the answerer positively to any commitment. Lack of commitment to S does not imply commitment to S. Lack of commitment to S does not imply commitment to ~S. And lack of commitment to ~S does not imply commitment to S. These are the ad ignorantiam principles which appear to be presumed by Hamblin's notion of commitment.

The following syntactical rules given by Hamblin (1970, p. 266) serve to define all permissible responses for each of the five types of permitted locutions in (H).

Syntactical rules:

S1. Each speaker contributes one locution at a time, except that a 'No commitment' locution may accompany a 'Why' one.

S2. 'Question S, T, . . ., X?' must be followed by

(a) 'Statement -- (S ∨ T ∨ . . . ∨ X)'

or (b) 'No commitment S ∨ T ∨ . . . ∨ X'

or (c) 'Statement S' or

'Statement T' or

——————— or

'Statement X'

or (d) 'No commitment S, T, . . ., X'

S3. 'Why S?' must be followed by

(a) 'Statement ¬S'

or (b) 'No commitment S'

or (c) 'Statement T' where T is equivalent to S by primitive definition.

or (d) 'Statements T, T ⊃ S' for any T.

S4. 'Statements S, T' may not be used except as in 3(d).

S5. 'Resolve S' must be followed by

(a) 'No commitment S'

or (b) 'No commitment ¬S'.

White always makes the first move in a dialogue, and thenceforth the two players take turns. From the sample dialogue given by Hamblin (p. 267) one infers that shifts can be made in the players' roles so that one who has been a questioner can become an answerer and vice versa at the same time for the other. This segment of the sample illustrates such a shift.

WHITE	BLACK
1. Why ¬B?	Statements A, A ⊃ ¬B.
2. No commitment A ⊃ ¬B; Why A ⊃ ¬B?	No commitment A ⊃ ¬B.
3. Statement B.	Why B?
4. Statements A, A ⊃ B	Why A ⊃ B?

At moves 1. and 2., White was the questioner, Black the answerer. Then at 3., White made a statement instead of asking a question. This option taken gave Black the opportunity to take up the role of questioner, as he did at 3. From that point in Hamblin's sample, Black remains the questioner.

Does an answerer have the option of becoming a questioner in (H) if the questioner doesn't want him to? Or is White always in the "driver's seat" if he doesn't stop questioning? The way the rules of (H) are framed, it seems that the only way Black can seize the chance of becoming questioner, unless White elects to make a statement instead of a question, is by virtue of S1. Black could, it seems, add 'Why S?' to his response 'No commitment T'. Or does the way the rule is stated require that the 'Why' locution precede the 'No commitment' locution? I am not sure. If the rule is meant to be asymmetrical, roles cannot be reversed at the answerer's option. Otherwise they can. The point is quite a significant one, insofar as the nature of the dialogue-game and the quality of play in generating interesting sequences is greatly influenced by the freedom the players have to change roles.

Another important property of (H) is that retractions of commitments are allowed. Notice in the sample above that Black had committed himself to $A \supset \neg B$ at step 1. and then moved to indicate 'No commitment $A \supset \neg B$' at step 2.

In effect then, Black withdrew or erased from his commitment-store a statement that had been contained in it. It is not strictly necessary for a game to have this feature of allowing retractions of commitments. Following Woods and Walton (1978) we will say that a game is cumulative if it does not allow retractions of commitments. That is, in a cumulative game, once a player has committed himself to a statement, he remains committed to it to the end of the game. As we will see, cumulative games are a much simpler class of games to work with. The organizing of retraction rules leads to several non-trivial problems.

Now we come to the rules for organizing the operation of commitment-stores of players of (H). There are five rules given by Hamblin (1970, p. 266f.).

Commitment-store operation:

C1. 'Statement S' places S in the speaker's commitment store except when it is already there, and in the hearer's commitment store unless his next locution states ¬S or indicates 'No commitment' to S (with or without other statements); or, if the hearer's next locution is 'Why S?', insertion of S in the hearer's store is suspended but will take place as soon as the hearer explicitly or tacitly accepts the proferred reasons (see below).

C2. 'Statements S, T' places both S and T in the speaker's and hearer's commitment stores under the same conditions as in C1.

C3. 'No commitment S, T, . . ., X' deletes from the speaker's commitment store any of S, T, . . ., X that are in it and are not axioms.

C4. 'Question S, T, . . ., X?' places the statement S ∨ T ∨ . . . ∨ X in the speaker's store unless it is already there, and in the hearer's store unless he replies with 'Statement ¬(S ∨ T ∨ . . . ∨ X)' or 'No commitment S ∨ T ∨ . . . ∨ X'.

C5. 'Why S?' places S in the hearer's store unless it is there already or he replies 'Statement ¬S' or 'No commitment S'.

These five rules make clear the alterations in commitments effected by the various kinds of moves. C1. seems natural in placing S in the speaker's store of commitments when he says 'Statement S'. But one could have opted not to thereby have put S in the hearer's commitment-store as well. However (H) requires the hearer to decline commitment to S in such a case or automatically receive it. If this way of designing the rule may turn out to have an effect on the game's modelling of fallacies, we might later want to question it and perhaps explore alternative ways of stating the rule.

Similarly, C4. makes it easier for the questioner by presuming the hearer's commitment to the presupposition of a question, but also restricts the questioner by automatically putting the presupposition in his store. One wonders here whether alternative mechanisms should be explored if much turns out to be significantly affected by these conventions in connection with the fallacies. And indeed, Hamblin subsequently discusses and explores alternative formulations of these commitment-rules.

Certainly where retraction is always possible, and need not hamper one's strategy in the game too greatly, the distribution of commitments to the players effected by C1. to C5. do not appear to be unduly restrictive or unfair. Whether these rules could be improved by alternative formulations would seem in the end to depend on the objectives of the players in carrying out the moves.

Now we have some grasp of the sort of set-up Hamblin has in mind, let us try to get a more general picture of what the various dialectical games come down to as a theoretical structure. Clearly, what Hamblin is involved in proposing as a general approach involves a radical reconstruction of what would appear to be taken for granted as the underlying concept of "argument" in many logic textbooks. In addition to "premisses" and "conclusion", we now have "players", "moves", and other alien-looking

notions, more reminiscent of game theory than logic as it is usually known. Hamblin is very well aware that what he proposes does involve quite a radical re-orientation of current presumptions about the notion of argument. He is also very careful to set out in a formal way the structure that he has in mind. In a major article (1971), he sets out a structure that provides a mathematical model of dialogue for the family of dialectical games utilized in Fallacies (1970).

Hamblin (1971) defines a dialogue as a set of locutions, L, and participants, P. By a dialogue of length n, he means a member of the set $(P \times L)^n$ of sequences of n locution-acts. A locution-act is a member of the set P X L of participant-locution pairs. Next, a set of rules is added which define within a dialogue D a set of legal dialogues K. A system is a triple ⟨P, L, K⟩. Hamblin's formal constructions are concerned with possible definitions and properties of K.

How helpful Hamblin's mathematical models of dialogue will be as models of argument for the traditional fallacies depends on the sort of formal conventions for dialogues he adopts, which in turn may depend on the purpose or objective that the participants are supposed to have in mind. Hamblin assumes (1971, p. 137) "that the purpose of the dialogue is the exchange of information among the participants." What

precisely constitutes "exchange of information" is not defined, but the assumption that dialogues are "information-oriented" (Hamblin's expression, p. 137) has strong implications for the design of the question-rules and commitment-rules of a dialogue. Hamblin takes as a consequence "that there is no point in making any statement to someone who is already committed to it, or in asking a question when one is already committed to one of the answers." (p. 137). Already however, such a presumption strongly affects any possible projected analysis of arguments resembling traditional fallacies. In connection with the fallacy of begging the question or the fallacy of many questions, it might be very useful strategy of dis-putation to ask one's opponent a question where the answer is already among one's commitments. For example, the answer might be the very thesis one is supposed to prove, so by asking the question one begs it. Or if the question has a complex presupposition constructed in such a way as to be damaging to the opponent's strategy, it might be a many-questions fallacy even if it is already contained within one's own commitment-set.

Therefore it seems that the direct applicability of Hamblin's system of dialogues to the study of certain of the fallacies is likely to be tangential. For it seems implausible that many of the traditional fallacies are committed only when exchange of information is the sole

purpose of participants in an argument. It seems to me much more likely that most of the traditional fallacies begin to appear as significant moves of argument in the context of disputation, where the objective of one party is to "prove" something contestively to the other, utilizing or extracting commitments from the other. The objective is not to "inform" but rather to "persuade", whatever either objective amounts to in more precise terms. This is not to deny the value of studying information-oriented systems as a significant type of dialogue game.

Hamblin however notes that the assumption of information orientation implies that participants may not "disagree", meaning that they are "simultaneously committed to contrary statements or sets of them." (p. 137). Surely this assumption must lead to questionable results if accepted as a universal principle built into any analysis of a traditional fallacy. Hamblin admits that "[i]n practice, statements sometimes have other functions than to inform," so his restriction to information oriented systems is not unreasonable. And it is of interest certainly to see where these systems lead, as models of dialogue.

But in practice, we may be adequately able to see certain arguments as fallacious, or criticisms as themselves open to criticism, only if we view the objective of the argument or criticism as other than "to inform someone

of something." If so, Hamblin dialogues are not universally applicable to arguments as models of the fallacies. They should be regarded more as a basic framework than a finished analysis.

The other question concerning the scope and applicability of Hamblin dialogues is: What does the function of "informing" amount to as an objective of a participant in dialogue? Presumably the purpose of engaging in moves of dialogue according to certain rules has some overall stated objective so that we can evaluate how one sequence of locutions has succeeded in being more informative than another. Do the players have some strategy that they can adopt in order to carry out this objective of "informing"? On these questions, it seems to me that Hamblin dialogues have little to offer by way of answers precisely formulated to be as useful as one would like. It does not seem, so far as I can tell, that there is some precisely formulated game criterion that a player can aim at as fulfillment of his objective of "informing". Consequently, it seems to me, the notion of a set of strategies available to a player to adopt in order to work towards such an objective is not one that is readily available in a Hamblin dialogue. Insofar as many of the fallacies systematically have to do in their analysis with strategies to achieve an objective in a set of moves, Hamblin dialogues give less guidance than will be needed. This is not to deny that

what there is in the structure of a Hamblin dialogue is enormously useful in helping us to understand how the fallacies can be understood as relating to certain kinds of moves in dialogue-sequences. However, what is indicated is that modifications or extensions of Hamblin games could be a useful direction to consider working on if one is to give analyses of the fallacies.

2.2 Prohibition of Circle-Games

The dialogue-systems of Mackenzie (1979) and (1981) are based on the Hamblin structures previously outlined. However, certain of their essential features have been designed by Mackenzie to contend with questions concerning the applicability of Hamblin games to circular argumentation. Hence it is probably a good idea to review these questions before turning to a fuller outline of Mackenzie games.

First, we should observe that circular dialogues can occur in (H). Here are some examples, where A, B, C, . . ., are atomic statements.

	WHITE	BLACK
(1)	Why A?	Statements A, A ⊃ A

WHITE	BLACK
(1) Why A?	Statements B, B ⊃ A
(2) Why B?	Statements A, A ⊃ B

This latter form of dialogue, called by Woods and Walton (1978) a <u>circle game</u>[1], can be carried through to n steps.

WHITE	BLACK
(1) Why A?	Statements A_1, $A_1 \supset A$
(2) Why A_1?	Statements A_2, $A_2 \supset A_1$
. .	.
. .	.
. .	.
(k) Why A_{n-1}?	Statements A_n, $A_n \supset A_{n-1}$
(k+1) Why A_n?	Statements A, $A \supset A_n$.

In the course of a discussion of various rules of (H), Hamblin puts forward two rules for consideration, suggesting that they jointly block circular reasoning. The first rule requires that the poser of a why-question not be committed to what the question asks, and also requires that the other party to the game be committed to it.

(W) 'Why S?' may not be used unless S is a commitment of the hearer and not of the speaker.

This rule reflects the information-orientation of Hamblin games. The question must be a genuine request for information--or in this instance, justification--in the sense that it must seek justification where there is none presently, but where justification is to be found. While (W) could seem arbitrary in the context of some dialogues, it also seems to truly reflect the information-oriented nature of the Hamblin games of dialogue.

The other rule restricts admissible answers to a why-question exclusively to statements that are already commitments of both participants.

(R1) The answer to 'Why S?', if it is not 'Statement ~S' or 'No commitment S', must be by way of statements that are already commitments of both speaker and hearer.

This rule seems to me even more sharply arbitrary in some games of dialogue. For it would seem to me that in games of disputation the central purpose of a why-question is to elicit statements that are not already commitments of the opposing player. To generate strategies, you need to increase the commitment-store of the opposing player. Perhaps however, restricting both players to previous commitments as bases for proof means that the players must be "information-oriented" in a conservative sense by sticking to what is previously established.

Whatever the fuller import of (W) and (R1), their present interest is that, according to Hamblin, they block petitio principii arguments when added to (H). Certainly we can see how this blockage works by turning back to the circle game above (the middle one of the three sequences presented above). In order for Black's answer at (1) to be legal, both B and B ⊃ A must already be commitments of both players. That is required by (R1). Hence White must be committed to B at (1). But according to (W), 'Why B?' cannot be asked if B is already a commitment of the asker. Hence by (W) and (R1), step (2) of the circle game can never be allowed as a legal move.

Here then is an interesting phenomenon of dialogues. (W) and (R1) jointly block the circle-game. It is not clear why, but it seems somehow informative that this should be the case.

At any rate, a further interesting fact is pointed out by Woods and Walton (1978)--problematic sequences can be constructed in (H) + (W) + (R1) that are not clearly non-circular. In other words, it is not clear that Hamblin's two rules really do have the effect of blocking circles altogether. Below is an example of one of these problematic dialogue-sequences. The initial commitment-store of each player is given in brackets at the head of the tableau. The superscript of a statement letter indicates the step-

number where that statement became a commitment of that player. A stroke through the statement indicates removal of the statement from the commitment-store. Remember that in (H) retractions of commitments are allowed. Finally, a superscript at a deleted statement letter indicates the step-number where that commitment was retracted.

WHITE [A ⊃ B, B ⊃ A, A^{2}, $\not{B}^{3}$]	BLACK [A, B, A ⊃ B, B ⊃ A, C]
(1) Why A?	Statements B, B ⊃ A
(2) Statement A	Statement C
(3) No commitment B; Why B?	Statements A, A ⊃ B
(4) Statement B	

Does this dialogue represent a petitio principii or not? Well, from one point of view, what Black did seems perfectly justifiable. First of all, he got White to agree to A. Then later, when White retracts his commitment to B, why should Black not then use A as a basis for argument to try to get White to re-assent to B? After all, by (R1) he is restricted to using only commitments of both parties as premisses for his attempted proofs. Yet on the other hand, looked at over-all, Black's sequence of moves does seem to go in a circle rather like the earlier circle-games. He used B to prove A, then turned around and used A to prove B. And that certainly seems to be circular.

No doubt part of the problem here concerns the

allowing of retractions. When White retracted his commitment to B at (3), does that not also seem to impair his commitment to A as well? For at (1) and (2), it seemed that the only reason he accepted A was because he was willing to accept B as a premissary base. Now he changes his mind about accepting B, should that mean he has also lost his commitment to A as well? Not in (H), for retractions are not in any way "closed" in requiring other retractions in (H). But in practice, this failure of White to connect his commitments in retraction seems a little strange.[2]

The considerations adduced so far thus pose a problem in applying the logical structure (H) to a traditional informal fallacy, the petitio principii. A number of ways of approaching the problem are possible. Should (H) be redesigned or should alternatives other than (W) and (R1) be considered? Or should we reconsider some other aspects? For one thing, if circle-games--including the one that seems to be a part of the Woods-Walton fragment--are in some sense fallacious or incorrect sequences, does that mean that they should always be excluded as legalized dialogues? Or rather, are some circles harmless, in which case designing rules of formal games to ban them could itself be a question-begging strategy?

Hamblin (1970, p. 271) calls (R1) an "unnecessarily strong rule" that "achieves the object of outlawing circular reasoning but makes it impossible to develop an argument more than one step at a time . . ." He then suggests (p. 272) that perhaps circles could be allowed provided the ultimate premisses at which an argument terminates are commitments of both parties. This suggestion does not appear to offer any resolution to the problem thought. It just makes us need to know just what is presumed to be wrong with arguing in a circle, when it is wrong.

Mackenzie's games are designed to confront the sort of problem with circles presented above, and it is time now to turn to them. They are based on Hamblin's type of game and are, like Hamblin's, also of interest quite generally as games of dialogue.

2.3 Mackenzie Formal Dialogues

The basic structure of dialogue for Mackenzie is the same as in Hamblin. We start with a set of locutions L and a set of participants P. A locution act is a member of P X L. A locution event is an ordered triple $\langle n, p, \ell \rangle$ where $\ell \in L$, $p \in P$, and n is a number that marks the "length" of the dialogue. That is locution events "come in order" beginning with O (See Mackenzie, 1980, p. 147). A dialectical system is a triple $\langle P, L, R \rangle$ where R is a

set of rules that excludes certain locution events as illegal.

Another feature devised by Hamblin and used by Mackenzie is the notion of an immediate logical relation. This notion is useful because in practice, arguers are not regarded as being committed to all the logical consequences of their assertions, but only the "immediate" or "obvious" ones. Thus Hamblin (1971, p. 144) proposes that for dialectical purposes a weaker relation than "consequence" should be adopted. Essentially, the relation of immediate consequence is a non-transitive (and presumably non-symmetrical but reflexive) relation such that there is a consequence relation between two statements if and only if there is a chain of immediate consequent relations leading from one to the other.

Mackenzie games also have commitment-stores, questions, and resolution demands just as in the Hamblin game (H), although the rules of each individual game diverge from (H). Where Mackenzie games most notably differ from Hamblin's is that they allow commitment to challenges as well as to statements. Like Hamblin, Mackenzie disavows that commitments are beliefs of a private sort, and writes that they should be "visualized as a slate on which tokens of locutions may be written and from which they may be erased. . . ." (1981, p. 163). A challenge is a request

for justification "Why S?" just as in (H). Mackenzie's innovation is that his different approach to the management of commitment-stores enables him to design systems that may be cumulative for challenges but not for statements. In the basic Mackenzie game below, the commitment rules allow for retraction of statements, but provide no way of retracting commitment to a challenge, or to an immediate consequence of that challenge.

The Mackenzie game DC has two participants, Wilma and Bob, who take turns putting forward locutions. Mackenzie uses P and Q for statement-letters, but otherwise the admissible locutions are the same as Hamblin's except that only "yes-no" questions are allowed. Thus there are five types of locutions (Mackenzie, 1979, p. 119).

(i) Statements: 'P', 'Q', etc. and truth-functional compounds of statements: 'Not P', 'If P then Q', 'Both P and Q'.

(ii) Withdrawals: The withdrawal of the statement 'P' is 'No commitment P'.

(iii) Questions: The question of the statement 'P' is 'Is it the case that P?'

(iv) Challenges: The challenge of the statement 'P' is 'Why is it to be supposed that P?' (or briefly 'Why P?').

(v) Resolution Demands: The resolution demand of the statement 'P' is 'Resolve whether P'.

Each type of locution has commitment rules. Questions and resolution demands do not in themselves affect commitment. There are four types of commitment rules in DC (Mackenzie, 1979, p. 119).

Statements: After a statement 'P', unless the preceding event was a challenge, 'P' is included in both participants' commitments.

Defences: After a statement 'P', when the preceding event was 'Why Q?', both 'P' and 'If P then Q' are included in both participants' commitments.

Withdrawals: After the withdrawal of 'P', the statement 'P' is not included in the speaker's commitment. The hearer's commitment is unchanged.

Challenges: After the challenge of 'P', the statement 'P' is included in the hearer's commitment: the statement 'P' is not included in the speaker's commitment: and the challenge 'Why P?' is included in the speaker's commitment.

As you can see, the novelty is the commitment rule for challenges. Commitment to a challenge seems a strange idea at first. Mackenzie (1981, p. 164) views a challenger's

commitment to a challenge intuitively as meaning that the challenger has declared the statement in question as "in doubt or problematic."

The Challenge Rule above has a similar effect on commitment placement to Hamblin's rule (W). We recall that (W) required of a why-question that the statement in it be a commitment of the hearer but not the speaker. Similarly, the Challenge Rule of DC eliminates the statement from the speaker's store if it was there to begin with, and includes it in the hearer's store. The difference is that (W) does not allow the challenge at all unless the conditions are right, whereas the Challenge Rule requires the right conditions once the question is asked.

In a moment we will see that Mackenzie's strategy for banning circles in DC is somewhat similar to Hamblin's, for Mackenzie adds a number of dialogue rules, one of which bears a resemblance to Hamblin's (R1). Other rules ensure a form of cumulativeness of challenges moreover, designed to block the Woods-Walton fragment. Seven rules of dialogue are given (Mackenzie, 1979, p. 121).

R_{Repstat}: No statement may occur if it is a commitment of both speaker and hearer at that stage.

R_{Imcon}: A conditional whose consequent is an immediate consequence of its antecedent must not be withdrawn.

R_{Quest}: After 'Is it the case that P?', the next event must be either 'P', 'Not P' or 'No commitment P'.

R_{LogChall}: A conditional whose consequent is an immediate consequence of its antecedent must not be challenged.

R_{Chall}: After 'Why P?', the next event must be either

(i) 'No commitment P'; or

(ii) The resolution demand of an immediate consequence conditional whose consequent is 'P' and whose antecedent is a conjunction of statements to which the challenger is committed; or

(iii) A statement not under challenge with respect to its speaker (i.e., a statement to whose challenge its hearer is not committed).

R_{Resolve}: The resolution demand of 'P' can occur only if either;

(i) 'P' is a conjunction of statements which are immediately inconsistent and to all of which its hearer is committed; or

(ii) 'P' is of the form 'If Q then R', and 'Q' is a conjunction of statements to all of which its hearer is committed; and 'R' is an immediate consequence of 'Q'; and the

previous event was either 'No commitment R' or 'Why R?'.

$R_{\text{Resolution}}$: After 'Resolve whether P', the next event must be either;

(i) the withdrawal of one of the conjuncts of 'P'; or

(ii) the withdrawal of one of the conjuncts of the antecedent of 'P'; or

(iii) the consequent of 'P'.

It is clear from the rules R_{Imcon} and R_{LogChall} that DC is cumulative with respect to immediate consequence conditionals. No rule forbids retraction of statements however. Therefore DC is not cumulative with respect to statements.

The rule R_{Resolve} enables a participant to object to an opponent who is either committed to an immediate inconsistency or who retracts a statement immediately implied by one of his commitments. $R_{\text{Resolution}}$ gives the same participant the power to back up her objection with a demand for her opponent to eliminate the inconsistency.

The design of the rules appears practically useful. They enable an objector to enforce a certain surface rationality in the opponent's commitment-store without requiring either party to be "omniscient" in the sense of complete closure of commitments under consequence. Thus the participants can be "irrational" in their commitments but must straighten out immediate inconsistencies on demand.

Now we come to R_{Chall}, the counterpart of Hamblin's (R1) that also had important relationships to the study of petitio principii. Circles aside for the moment, let us see how R_{Chall} works. If one player, say Wilma, is challenged 'Why P?' by another player, Bob, Wilma has three legal options according to R_{Chall}. She can reply 'No commitment P'. Or she can reply 'Resolve whether if Q then P', if it should happen that Bob is committed to some statement(s) Q where P is an immediate consequence of Q. Her third option is to reply with a statement that Bob is not now committed to, say R. This reply would mean, according to the Defenses commitment rule, that both R and 'If R then P' then become included in the commitment-stores of both Wilma and Bob.

Before introducing the other Mackenzie games, it may clarify the practical rationale of DC somewhat if we now turn to the question of how DC is designed to cope with the petitio principii problems posed by the Hamblin game (H).

2.4 Circles in Mackenzie Games

The simplest types of circle-games are made illegal by the rules of DC. Consider the dialogue below.

n Bob: Why P?

n+1 Wilma: P

According to the Challenges commitment rule, at n 'Why P?' must be included in Bob's commitment-store, i.e. P is under challenge with respect to Wilma. Hence by clause (iii) of R_{Chall}, Wilma's move at n + 1 is illegal. Mackenzie (1979, p. 125) calls this dialogue "the simplest form of begging the question". He adds that it embodies the principle that one cannot use as a defence any statement that has been challenged by an opponent.

In effect then, the banning of the simplest circle-game in DC is by a means quite parallel to Hamblin's banning of circles by adding (R1) to (H). One's opponent is not allowed to use as premisses statements that one is not committed to. Then too, seemingly somewhat similar to Hamblin, the system requires that asking for justification of a statement presumes that one is committed to challenging that statement.

What about the other basic type of circle-game?

n	Bob:	Why P?
n + 1	Wilma:	Q
n + 2	Bob:	Why Q?
n + 3	Wilma:	P

The same type of prohibition bans this dialogue. P is under challenge with respect to Wilma at n. But then at n + 3 Wilma replies to a challenge by citing P as a premiss

for justifying Q. Once again therefore, she violates the third clause of R_{Chall} which requires a reply by means of a statement not under challenge with respect to the one who replies.

It seems a little peculiar here that P is "under challenge" with respect to Wilma even though by the Defences rule of commitment, both 'If Q then P' and Q are included in both participants' commitments. For according to Mackenzie, this would mean that both participants are, as he calls it, de facto committed to P. However, de facto commitment does not imply commitment but only openness to challenge.[3] Mackenzie (1979, p. 123) defines p (a player) as de facto committed to P (a statement) if and only if p is open to a resolution demand if he denies, withdraws or challenges P. It also seems a little peculiar that the challenge 'Why Q?' is included in Bob's commitment-store at n + 2, even though both Bob and Wilma are committed to Q at n + 1 by the Defences commitment rule. Thus it appears to be acceptable for Mackenzie that one can be both committed to a statement and its challenge at the same time. And indeed, it is possible in DC that p can be both committed to P and committed to the challenge 'Why P?' at a given dialogue-stage.

Here then the difference between Mackenzie's set-up and Hamblin's rule (W) emerges. Rule (W) bans n + 2 because

Bob cannot even ask 'Why Q?' given his commitment to Q at n + 1. In DC however, one can legally ask 'Why Q?' whether one is previously committed to it or not. However one cannot answer the question by using any statement one has previously challenged. Moreover, commitments to challenge are inerasable.

Now we can see how Mackenzie will handle the Woods-Walton fragment in DC. We recall that the initial commitment-store of Wilma is {B, if A then B, if B then A} and the initial commitment-store of Bob is {A, B, if A then B, if B then A}. In DC, the Woods-Walton sequence looks like this.

n	Wilma:	Why A?
n + 1	Bob:	B
n + 2	Wilma:	A
n + 3	Bob:	C
n + 4	Wilma:	Why B?
n + 5	Bob:	A
n + 6	Wilma:	B

This dialogue is illegal in DC because Bob broke R_{Chall} at n + 5 by replying to a challenge with a statement that was then under challenge with respect to him. Hence according to Mackenzie (1979, p. 127), Bob begged the question at n + 5.

But has Bob truly committed a fallacy of petitio

principii? Against this allegation, Woods and Walton (1982) cite the irksome fact that Wilma had accepted A at n + 2. Given that Wilma remains committed to A from that point on, it may not be unfallacious on Bob's part to use A as a response to Wilma's query 'Why B?'. The principle appealed to in defending Bob's reasonableness is stated in Woods and Walton (1982): any statement that one's opponent has previously acknowledged commitment to is a fair basis from which one may try to extend that opponent's commitments to by argument. Indeed, something like this seems to provide the basis of Hamblin's rule (R1) requiring that premisses for proofs be selected only from the opponent's commitments.

From Bob's point of view, surely it should be suggested that if there is error in the dialogue, it is more on the side of Wilma. She challenged 'Why A?' and then later went on to freely commit herself to A. Then she became committed at n + 1 to B, and subsequently at n + 4 went on to commit herself to the challenge 'Why B?'. Strange behavior! But perhaps the intuition that Wilma's moves are not coherent stems from the rules of DC. For according to these rules, Wilma can be committed to A and yet at the same dialogue-stage also be committed to the challenge of A. The whole notion of commitment to challenge, implying it is said to be according to Mackenzie (1981, p. 164) a declaration of doubt or indication of

the problematic nature of the statement challenged, seems to become thin or hypocritical if one is allowed to adopt it while oneself accepting into one's commitment store the very statement one is supposedly committed to challenging. If the commitment to challenge then is so thin in what it enforces on the challenger, why should it fairly hold the one challenged from using the challenger's commitments in further proofs? DC certainly, at any rate, poses some interesting questions.

But according to the response of Woods and Walton (1982) the construction of DC does not adequately answer the question of whether the Woods-Walton dialogue represents a fallacious petitio. Rather the answer given by Mackenzie seemed to us then merely of a conditional sort. Yes, Bob has begged the question if challenge commitments are cumulative. But no, he has not if challenge commitments can be subsequently retracted.

Sensitive to the relativity of games of dialogue, Mackenzie (1979, p. 127f.) constructs another game DD which is like DC except that the commitment rule for challenges is non-cumulative. In this system, if a player commits herself to P then her previous commitment to 'Why P?' is removed. In DD, the Woods-Walton dialogue becomes non-circular. By asserting A at n + 2, Wilma removed A from her challenge commitment. Hence the dialogue is quite

legal, and according to Mackenzie, Bob did not beg the question.

Some of the finer points of the interpretation of the Woods-Walton dialogue are lively topics of dispute and are likely to remain so. For example, Mackenzie (1979, p. 128) argues that if the dialogue is amended to read "more naturally", Bob can be convicted of begging the question in DD as well. For our part, John Woods and I persist in our feeling that naturalness is not the important issue and that the question is one of the theoretical capacity of certain classes of games to deal with certain patterns of dialogue (even if they are not "normal" or "usual" patterns).

Rather than debate these finer points here, it may be more helpful to pass along to a larger question: granted that circle-games can be blocked or permitted as legal dialogues in formal games of dialogue, what is shown about petitio principii as a fallacy? In a sense then, we are asking: what's wrong with arguing in a circle? Does the difference between the set of rules that ban circles and the set that allows them amount to some explanation of why or when circle-argumentation is fallacious? As we saw in previous discussions, practical examples suggest that occasionally circular arguments may be benign or non-fallacious in dialogue. If so, how can we differentiate

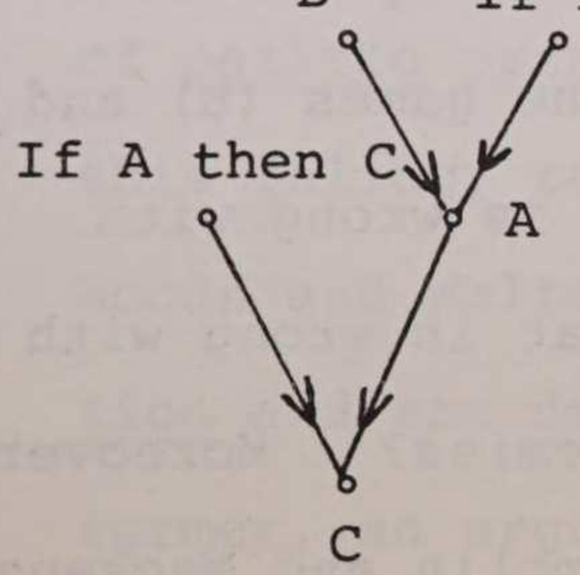
between benign and vicious circles? These questions suggest the need for a different line of attack on the problems raised by Hamblin and Mackenzie games.

Remarks of Mackenzie (personal correspondence of May 8, 1979) also suggest that the Woods-Walton fragment may not be circular in any harmful sense--Bob and Wilma appear to act more foolishly than illegally--like a soccer team that keeps scoring its own goals. If so, we need to know what it is that tends to make a circle become harmful.

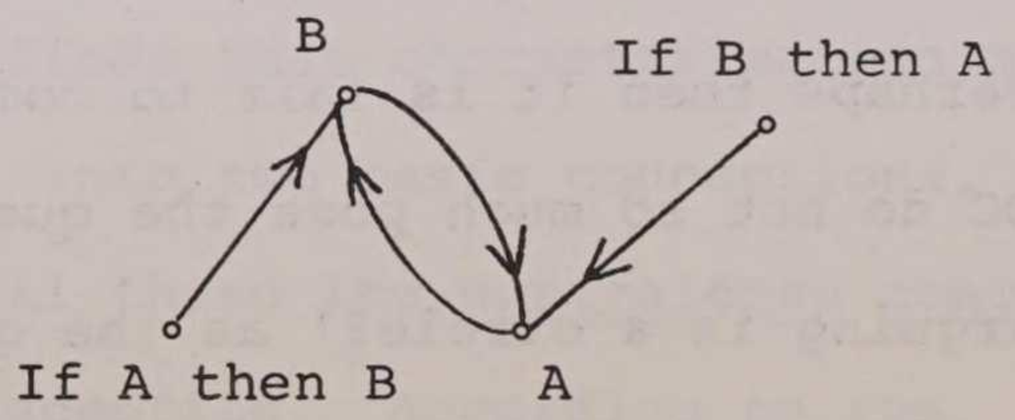
2.5 What's Wrong with Arguing in a Circle?

In (H), arguing in a circle is illegal because it is an instance of using a statement as premiss that one's opponent is not committed to. In DC, arguing in a circle is illegal because it is an instance of using a statement as premiss that is under challenge at the time. However, one may well want to question whether there is a difference between arguing in a circle and what it is alleged to be an instance of, in either of these claims. The DC dialogue below on the left is a case of using a statement as premiss that is under challenge. But as the graph of the dialogue below it indicates, this dialogue is not a case of arguing in a circle.

n	Wilma:	Why A?
n + 1	Bob:	B
n + 2	Wilma:	Why C?
n + 3	Bob:	A



n	Wilma:	Why A?
n + 1	Bob:	B
n + 2	Wilma:	Why B?
n + 3	Bob:	A



The dialogue on the right is a circle-game however, and its graph, which appears below it, displays the looping pair of arcs between B and C. Yet of course the circular dialogue on the right is also a case of using a statement as a premiss that is under challenge. It thus appears that using as premiss a statement under challenge, when it is wrong, may not be wrong in all the same cases, or for the same reasons that arguing in a circle is wrong.

What appears to be presupposed by Hamblin and Mackenzie is that arguing in a circle is wrong insofar as it is a special case of using a statement as a premiss that is under challenge. At least, one would think that such a presupposition might explain their proposals to ban circles by prohibiting the use of statements under challenge as premisses.

And indeed, it is proved in Woods and Walton (1978) that all instances of circles are also instances of the use of statements under challenge as premisses in DC. Clearly however, as the dialogues and their graphs above indicate, the converse implication fails to hold in every instance. Perhaps then it is fair to comment that the games (H) and DC do not so much pose the question 'What is wrong with arguing in a circle?' as the question 'What is wrong with using a statement under challenge as a premiss?' Moreover, the alternative game-rules proposed by Hamblin and Mackenzie make it clear that in their view, in many instances there is nothing at all wrong with using a statement under challenge as a premiss.

Woods and Walton (1978) use the term <u>challenge-busting</u> to refer to an instance where an arguer uses as a premiss for his argument a statement that his opponent is not committed to or has challenged. It seems then that we ought to distinguish between circularity of argument and challenge-busting.

To complicate matters a little, there is yet a third type of notion that ought to be distinguished from these two other ideas. This is the requirement that there is an ordering of a set of statements in argument. Usually this ordering is given an epistemic description, i.e: that some statements are "better known" or "more well-established"

than others. Consequently, challenge-busting in an epistemic guise appears as the choosing of a statement as premiss not better known than the conclusion one is to prove by argument.

If one looks over the traditional textbook accounts of petitio principii, one finds that characterization of this fallacy tends to fall into two basic conceptions. Woods and Walton (1975) call these the equivalence conception and the dependency conception. According to the former, an argument is said to be circular where the conclusion itself, or an equivalent, is assumed as one of the premisses. For example, according to Copi (1972, 4th ed.):

> If one assumes as a premiss for his argument the very conclusion he intends to prove, the fallacy committed is that of petitio principii, or begging the question. If the proposition to be established is formulated in exactly the same words both as premiss and as conclusion, the mistake would be so glaring as to deceive no one. Often, however, two formulations can be sufficiently different to obscure the fact that one and the same proposition occurs both as premiss and conclusion.

The problem of course is to specify just how "closely equivalent" the conclusion and premiss have to be for the argument to qualify as circular. If one premiss is equivalent to the conclusion, then the other premisses are deductively redundant. So superfluity of premisses might be a fault of the argument as well. However, if the equivalent premiss is non-obviously equivalent to the

conclusion, it may be questionable whether the argument is circular at all. So the equivalency conception has its problems, yet it persists in current texts, and its long tradition of appearance in texts and manuals might suggest there is something in it.

According to the dependency conception, an argument is circular if one of the premisses depends on the conclusion, meaning that proof of the conclusion is required to establish the truth of the premiss. The appropriateness of the phrase "arguing in a circle" is easy to appreciate. Normally the premisses "prove" the conclusion. But if the conclusion is, in turn, required to "prove" part of the premisses, we are going in a closed loop or circle in our proving.

In Topics (162 b 34), Aristotle seems to allude to the equivalence conception when he describes one form of begging the question as an argument where someone begs the actual point requiring to be shown. However in the Prior Analytics (64 b 30), Aristotle makes his famous point that demonstration proceeds from what is more certain and prior. Here then is the ordering of propositions according to how well they are known. Aristotle then goes on to state that one way a demonstration can fall short occurs where the demonstrator selects premisses that are less known or equally well-known in relation to the

conclusion he is to prove. As Woods and Walton (1982a, p. 84) note, Aristotle seems to be distinguishing here between the petitio and failure to select epistemically appropriate premisses.

Aristotle then goes on to formulate his famous criterion of question-begging (Prior Analytics 64 b 37): ". . . whenever a man tries to prove what is not self-evident by means of itself, then he begs the original question." Aristotle gives further examples to indicate he may also have the dependency conception in mind. However, his remarks on petitio in the Prior Analytics appear to become obscure or at least difficult at a certain point, and readers should be referred to Hamblin (1970, p. 74ff.) and Woods and Walton (1982a, p. 86ff.) for further discussions. We might remark here however that Aristotle at one point in the Posterior Analytics (72 b 33) writes about advocates of circular demonstration. These and other remarks suggest that a case can be made that circular argumentation is not always fallacious, reminding us of current disputes in epistemology between foundationalists and coherentists. It has gotten a little clearer then that sometimes there may be something wrong with arguing in a circle. But what precisely is wrong and how we can determine when the fault exists or does not, remain highly elusive.

Perhaps the best way to gain a better perspective on the problem is to review some practical examples. We saw already that in some instances, like that of the man who timed his firing of the work-leaving gun by the clock across the street, represent vicious circles or faults of reasoning. Another example of circular reasoning we looked at, concerning the economics and population trends of a province, seemed to show that in some cases circular reasoning may be relatively harmless. What is the difference? Could it be that evidential priority is appropriate in some contexts of arguments but not in others? Perhaps then, fallacious circular reasoning occurs because the circle violates a principle of priority when that principle is appropriate.

Some examples from mathematics seem to suggest this prognosis on circularity. The theory of types imposes a principle of priority, a set of levels evidently violated by including within a set another set which should properly be kept to a "higher level". According to the "vicious circle principle" the 'set of all sets that are not members of themselves' is an improper set because it includes in a set itself a defining property that refers to all sets. There should be a first level, where properties may be predicated of sets. But then at a second level belong properties pertaining to the properties predicated of sets.

To define a second-level concept at the first level is to violate the ordering and thereby to invite mischief. As it turns out the set of all sets that are not members of themselves involves a contradiction. If it is a member of itself then it belongs to the set of all sets that are not members of themselves, so it is not a member of itself. If it is not a member of itself, then it belongs to the set of all sets that are not members of themselves, so it is a member of itself.

The paradox of the liar may also involve a kind of self-reference that is a form of vicious circle. Tarski's solution of the paradox in effect involves dividing languages into a hierarchy of object-language, metalanguage, metametalanguage and so forth.[4] Hence by establishing an ordering of priority in languages, one avoids the vicious circle involved in the self-referential sentence 'This sentence is false.' Vicious circles apparently of a similar sort also occur in legal reasoning.

Scott Buresh, reported in Hofstadter (1982, p. 16) describes a classic legal paradox of the separation of powers. Suppose Congress were to pass a law saying that henceforth all determinations by the Supreme Court must now be made by a 6-3 majority, as opposed to the present 5-4 majority. Suppose then that this new law passed by Congress is challenged in a lower court, and eventually

reaches the Supreme Court, where it is declared unconstitutional by a 5-4 majority.

To cope with this sort of problem and other conflicts between rules of different types, legal systems sometimes form levels of logical priority in the binding of rules. This is necessary because rules have to be made governing the making of rules. Some rules that govern the making of statutes are constitutional rules, and are therefore laid down as being beyond the reach of the power of the non-constitutional statutes that they govern. Thus two types of rules are recognized and the congressional rules are therefore treated as logically prior to the non-congressional statutes. The constitutional rules not only prevail over the others in a conflict, but they are also harder to amend, and are regarded as more firmly established.

It could be that a similar sort of circularity is implicit in the theological paradox posed by the question, 'Can God make a stone too heavy for him to lift?' If so, there is something he cannot lift, so he is not omnipotent. If not, there is something he can't do, so he is not omnipotent. Either he can make such a stone or not. Therefore, God is not omnipotent.[5] Like the legislative problem, the solution here seems to involve a separation of powers. We should distinguish between the power to do things at level

one, e.g. lift rocks, and the power to define or regulate an individual's level-one powers at a second level of power. At any rate, some sort of order of levels seems to be involved in whatever vicious circle is posed by this theological dilemma.

Another example of an ordering of propositions is given by Mackenzie (1980): in mathematical proof, theorems are numbered, and we must not use a higher-numbered theorem in proving a theorem with a lower number. Although it might be hard to find a statement requiring this ordering in writings on mathematical logic, it is certainly a practice consistently adhered to by mathematicians constructing proofs. According to Mackenzie (1980, p. 145), this rule of ordering in proof is not a matter of the implication relations in the mathematical theory itself where proofs are being constructed. But rather it has to do with the way the theory is being presented. In fact the same theorems could be presented in a different order, so that axioms in one system could be theorems far removed from the axioms in another system. And indeed, it does happen in mathematics that two different axiom systems (differently ordered sets of statements) turn out to be equivalent (disregarding their order, every theorem of the one system is also a theorem of the other).

Mackenzie (1980) takes the position that arguing

in a circle is fallacious just where a defence breaks the rule R_{Chall} of DC. Hence the artificial hierarchy of a deductive theory with its rule about higher-numbered theorems represents a "crib or strategy" which provides answers to any challenge about the mathematical subject-matter axiomatized. This suggestion is quite a good one, and should be carried forward. It does seem that "logical priority" is in a way a matter of strategy in presenting one's argument as opposed to a strict question of proof or valid inference. But Mackenzie sheds no light on the question of what a strategy in argument is, or what the objective of a "strategy" could be in a game of dialogue.

In passing we might note that, as Mackenzie also observes (1980, p. 140), R_{Chall} does not prohibit equivalence circle-games like the infinitely continuable games below.

n	Wilma:	Why A?
n + 1	Bob:	¬¬A
n + 2	Wilma:	Why ¬¬A?
n + 3	Bob:	¬¬¬¬A

n	Wilma:	Why A?
n + 1	Bob:	A ∨ A
n + 2	Wilma:	Why A ∨ A?
n + 3	Bob:	A ∨ A ∨ A

Nor does R_{Chall} prevent other circle-games, e.g.

n	Wilma:	Why A?
n + 1	Bob:	A ∧ B
n + 2	Wilma:	Why A ∧ B?
n + 3	Bob:	A ∧ B ∧ C

Mackenzie, however, defends the non-circularity of some instances of these games by citing this argument (1980, p. 140, note 5): "When I was recently challenged for saying that April has only thirty days, I replied 'Thirty days hath September, April, June and November,' which is in form like [the third dialogue above], but the challenger seemed satisfied." Suffice it to say however that even if there are some non-fallacious instances of the three dialogues above, it by no means follows that all instances of them are non-fallacious. To wit,

Wilma:	Prove to me that 2 + 2 = 4.
Bob:	All right. Thomas Hobbes is dead and 2 + 2 = 4. Therefore 2 + 2 = 4.

So the problem remains to distinguish between the fallacious instances of these and other dialogue-sequences we have presented and their non-fallacious counterparts (if they always exist). More pointedly, we should also add that there may be a distinction between an argument and a

reminder. As a reminder, the 'Thirty days hath September' statement may be quite harmless. Indeed, if it is a reminder, it is hard to see how it could commit a fallacy at all on the presumption that all fallacies are fallacious arguments.

To get back to our main theme then, what is it about these orderings or "logical priorities" that reveals any insight into how or when circular reasoning is fallacious? Moreover, if a different yet equivalent axiom system can have a different order of theorem-numbering from another, could it be that an argument is circular in one system but circle-free in another? Since it seems so, does the consequent relativity of question-begging undermine its claim to be a serious logical fallacy?

2.6 Hintikka Logical Dialogues

In keeping with the spirit of Socratic dialogues, Hintikka (1979) adopts as a general feature a rough symmetry between the two players of a game of dialogue. Each player is set to prove his own thesis by means of premisses elicited from his opponent. There are two players $\mathcal{A}$ and $\mathcal{B}$. Each of them puts forward an initial thesis A_o and B_o respectively. Then each speaker, by posing questions to the other, elicits additional theses from him. Through the course of the game, each player is allowed to use, as

premisses to prove his own thesis, only the propositions he has elicited as theses of the other. Also, each player must defend all the responses he himself has made by way of reply to the other speaker's questions.

Hintikka views these games of dialogue less as a cooperative enterprise than as a competition. Each player is trying to reach his end before the other does. However, these two ends need not be incompatible. The special type of game where they are logically incompatible is called a dispute (Hintikka, 1979). In such a case, according to Hintikka, the task of proving one's thesis from the opponent's thesis turns out to be equivalent to the task of proving one's own thesis absolutely. For this task amounts to eliminating all the possibilities that are incompatible with one's own thesis.

For Hintikka, games of dialogue are in one way an application of epistemic logic and also imperative logic. This is so because of Hintikka's analysis of questions whereby a question like 'Who lives in that house' is analyzed as an epistemic statement within a command, viz. 'Bring it about that I know who lives in that house!' Hintikka's rules for dialogical games (1979, p. 360) are given as below. Each player keeps a score sheet which has the form of a tableau or list of propositions. Each player writes his own initial thesis into the right column

of his tableau, and writes his opponent's thesis into the left column of his own tableau. After the initial move, subsequent ones can be of two kinds only--deductive or interrogative moves.

Deductive move. A move may consist in a finite number of applications of the rules of tableau construction. The applications pertain to the tableau of the player making the move. The only restriction is that the rules introducing new individual constants are applied only to expressions which are in the tableau already before this move. Otherwise the number of uses of the tableau rules is arbitrary (but finite), and so is the order in which the rules are applied.

Interrogative moves can be of either of two different kinds.

(i) A move may consist in a question addressed by the player who is making the move to his opponent. The opponent provides a direct full answer to the question. The answer is added to the list of theses which the addressee of the question is defending. It is entered into the left column of the tableau of the player making the move and into the right column of the other player. The presupposition of the question is added to the theses of the player who is making the move. It is entered into the right column of his tableau and into the left column of his opponent.

(ii) In an interrogative move, the opponent may refuse to answer. Then the negation of the presupposition of the question is added to one's opponent's theses, e.g. is added to one's own left column and to one's opponent's right column.

Rule for winning and losing. (i) If a player has closed his tableau while his opponent has not done so, he has won and the opponent has lost. (ii) If a player cannot give a full answer to his opponent's question, he has lost and the opponent has won.

Hintikka proposes these two types of rules because he is interested in using games of dialogue to model the interplay between logical inference and new information (elicited in the game by the questions). Hence these games are called information-seeking dialogues. One hoped-for application of these dialogues is to study fallacies like begging the question and fallacies of multiple questions.

In another paper, Hintikka and Saarinen (1979) use dialogical games to investigate the question of whether there is a logic of natural language. They argue that classical first-order rules have to be modified in the same way in which they have to be modified in the transition to intuitionistic logic. The rules left unmodified by intuitionists are not applicable to all game rules, moreover. It is concluded that neither classical nor intuitionistic logic is entirely appropriate, and therefore a new type of non-classical logic needs to be justified in the framework of games of dialogue.

The rules given by Hintikka above fall under the Hamblin-Mackenzie dialectical systems with two notable exceptions. First, there is a rule defining the win-loss outome of the game. That is a significant step forward, in a salutary direction. Second, while the opponent may "refuse to answer", according to interrogative rule (ii),

if he does so, the negation of the presupposition of the question is added to his theses. Thus Hintikka-dialogues are less open than Hamblin or Mackenzie dialogues. The Hamblin 'No commitment' response is not fully available in the Hintikka dialogues. In effect, the answerer may be forced to commit himself either to the presupposition of a question or its negation.

Such a regulation certainly speeds the game along, balances out the power of the opponents, and effectively solves the problem of the answerer who stalls the game's progress by refusing ever to commit herself. On the other hand, it gives the questioner the power to freely commit question-asking fallacies without the answerer having some means of coping. In answer to the question 'Is a zebra black or white?' the answerer must reply one way or the other, or the negation of the presupposition of the question, namely 'A zebra is neither black nor white' is added to his set of commitments.

Despite this difficulty, the Hintikka game, it should be stressed, is a major advance over the Hamblin-Mackenzie games. By having a win-loss rule, it opens up the whole avenue of possible strategies in games of dialogue. Moreover, the Hintikka interrogative rule does produce a balance of power that makes for interesting play. It forces the answerer to make solid commitments, and thereby

incur serious risk of losing. It therefore opens the way for an aggressive questioner to force defeat upon his adversary.

But the game is heavily weighted in favor of the questioner. In fact, it allows the questioner to systematically commit complex question fallacies. It even builds in a systematic form of the ad ignorantiam fallacy into the questioner's legitimately open moves. In effect, the answerer may become committed to the falsehood of statement A if only in virtue of his refusal to answer a question that has A as presupposition. It seems then that alternatives to the Hintikka system should be explored.

2.7 Rescher Dialectics

The system of formal disputation given in Rescher (1976) corresponds to the medieval game of obligation.[6] In obligation, there is an exchange of statements between two participants, and each attempts to lead the other to violate some prescribed rule of argumentation. The opponens (obiciens, arguens) moved first, and it was his task to make his thesis known and to set out arguments for it. The respondens (defendens) was placed in the more limited role of responding to the moves of the opponens. Each party had his set of rules. Those for

the opponens were called positio, and included various signs of obligation (signa obligationis), e.g. "I posit" (pono), "I lay down" (depono), and "I admit" (admitto). Those for the respondens were called depositio.[7] Rescher follows this general pattern of asymmetry between two participants. The move of categorical assertion, !P, read as "P is the case" or "P is maintained by me" can be made only by the proponent, whereas the move of cautious assertion, †P, read as "P is the case for all you have shown" or "P is compatible with everything you have said" can only be made by the opponent.[8] P and Q are variables for statements.

However, in the third item in the inventory of fundamental moves, Rescher's system begins to depart from the mainstream of the medieval tradition. The third item allows participants to construct inferences by the relation of provisoed assertion, P/Q, read as "P generally (or usually or ordinarily) obtains provided that Q" or "P obtains, other things being equal, when Q does" or "P obtains in all (or most) ordinary circumstances (or possible worlds) when Q does" or "Q constitutes prima facie evidence for P." (p. 6). Despite what one might expect, the provisoed assertion relation is not a matter of probabilities--as the author puts it (p. 7), a matter of how things go mostly or usually--but rather a matter of how

things go <u>normally</u> or <u>as a rule</u>. Emphatically P/Q is not deductive implication either because P/Q is quite compatible with ~P/Q&R (p. 7). ~P is the negation of P in Rescher's notation. The characteristic move of <u>dis-tinction</u> in disputation involves a participant's rejoinder that while P by itself may tend to support Q, the "new information" R added to Q changes the situation so as to militate against R. In the context of a dialectically probative investigation we might encounter the following sequence.

Pro	Con
P/Q & !Q	~P/(Q&R) & †(Q&R)

So long as provisoed assertion is less than totally conclusive, it is possible that "a good case" can be made for two incompatible theses. However, this waiving of the Law of Contradiction is not complete, for (P&~P)/Q is not allowed, and the combination of P/Q with ~P/Q is always blocked (p. 63).

Transitivity and detachment fail for the slash. Detachment must fail because if we had 'P/Q, Q, therefore P' we could not also possibly have '~P/Q&R), Q&R, therefore ~P' without producing a contradiction. I cannot find any comments on the reflexivity or symmetry of the slash. These latter two properties are especially interesting in

connection with the occurrence of circular sequences in dialogues. Probably Rescher would want the slash to be non-symmetrical (but not asymmetrical), and that ruling would not block circular moves of the form 'P/Q and also Q/P'. The first patterns of circular sequences explicitly ruled out by Rescher are repetitions, e.g.

Proponent	Opponent
!P	†~P
!P	

But it is made clear (p. 20) that the author wishes to extend this "blockage rule" to deal with two other possible circular moves. First, such a rule "precludes the proponent from reasserting (or the opponent for rechallenging) something he has effectively asserted (or challenged) before." (p. 20). One example would be as follows.

Proponent	Opponent
!P	† ~P
!~~P = !P	

It is interesting to note that this sequence would be an instance of what has been called the <u>equivalence conception</u> of the fallacy of <u>petitio principii</u>. The second example cited (p. 20) is the paradigm case of its bedfellow,

the dependency conception of petitio.[9]

Proponent	Opponent
!P	† ~P
P/Q & !Q	† ~Q
Q/P & !P	

In my own opinion, while the first sequence of the pair directly above is indeed fairly described as a case of the proponent "asserting something he has asserted before," the second case is better characterized by saying that the proponent first argues for P on the basis of Q, and then (circularly) argues for Q on the basis of P. However, it is perhaps not worthwhile to cavil about the verbal description of these two instances of circular argument. Rather, the critical problem is: how to design a clear and explicit set of rules to block them?

We pause only for two brief observations. First, it might be very hard indeed to design an explicit rule to block all the equivalences that might produce circles of the first type while at the same time occasionally allowing some equivalences as legitimate moves of disputations, as they sometimes seem to be. Second, it would appear that the author feels that it is necessary to introduce a separate "blockage rule" to ban the second kind of circle rather than simply requiring the slash to be

antisymmetric. The problem is that the rule for this purpose is nowhere explicitly stated. Since the slash is not transitive (and we can never therefore, in a Rescher game, have "chains" of arguments) perhaps it might do, one conjectures, to simply rule as follows: if, for any P and Q, the proponent makes an assertion of the form "P/Q & !Q" at line i, then at no line j subsequent to i may the proponent make a move of the form "Q/P & !P" (plus a similar rule for the opponent). Perhaps too we could formulate a rule to cover the equivalence type of circularity by simply blocking all equivalences in equivalential moves of that sort.[10] These are only conjectures, however, Rescher offers no explicit rules himself.

One more property that the slash doesn't have is the principle that anything follows from an inconsistent set of theses (p. 64). One might now wonder: with all these properties the slash doesn't have, what properties does it have? The fact that no very substantive answer is given indicates at least that the slash is something of a stranger on the logical scene. Perhaps that is why Rescher "for simplicity" supposes that in a formal disputation moves of the form P/Q are always "correct", i.e., beyond dispute or challenge. This supposition of correctness is bound to be unsettling, not least to logicians. However Rescher's

remarks on the philosophical motivations of his framework of formal disputation serve to some extent to explain the elusiveness of the slash as a purely logical relation.

In evaluating arguments involving provisoed assertions, we are told in chapter 8, factors of the actual historical process of the development of its argument can play a role in the assessment of an evidential claim. In other words, the dialectical approach could systematically commit what we have called the ad hominem, importing questions of historical background into questions of probative justification of a thesis (p. 119). In dialectics we are mixing psychology (the process of thinking in its actual occurrence) with logic, in the face of the familiar positivistic warnings that this mixture is heterogeneous and highly unstable. Rescher's reply is that deductive fallacies need not be dialectically fallacious and that in a dialectical setting the epistemic standing of the conclusion must always be relativized (context-dependent) to the line or course of argumentation. In his terms, we are going beyond the content of evidence to the entire course of argumentation by which it is marshalled (p. 117).

In chapter 7, a Hegelian approach is taken of viewing the process of justification as an essentially cyclic process of aufgehoben-like steps: initial position to flaw-probing counterargument to improved version of position

to initial position again, and so forth around the carousel. The process must be cyclic according to Rescher because the continuing process of evaluation and justification of arguments is never required to proceed ex nihilo--we are "invariably and inevitably born into a preexisting world with a preexisting social order and a preexisting body of knowledge or purported knowledge" (p. 101). Thus an evolutionary process of natural selection is always at work in inquiry--we start from a given position and work towards improvements. Rescher rejects the parallel drawn by J. S. Mill between survival of beliefs in the intellectual community and biological struggle for "survival of the fittest", however, as an overly optimistic view. It is not our beliefs, at the theoretical level, that evolve in such a way as to provide an evolutionary justification of the standards of rationality, rather it is the communal, evolutionary development of our open-ended but systematic cognitive methodology that justifies our acceptance as (presumably) true the conclusions of good arguments by established standards. By a shift from beliefs to methods, Rescher hopes to evade Humean doubts about the future resembling the past and to anchor his evolutionary epistemology in the realm of praxis rather than that of pure theory.

It would be an interesting question to pose to

Rescher why circles in the structures of formal disputation are blocked in chapter 1 while the cyclic process of evolutionary justification of cognitive methodology is allowed and even championed in chapter 7. No doubt one reason is that the circles of chapter 1 are mere drone-like repetitions whereas the cycles of chapter 7 are somehow essentially ampliative and informatively cumulative in character. No general account of the difference between ampliative and non-ampliative circles is attempted by Rescher however.

Where Rescher dialectics seem to differ most markedly from Hamblin, Mackenzie or Hintikka dialogues lies in the feature that each party has a separate and differently structured set of rules. Hence a Rescher dialogue, like the traditional obligation game, is strongly asymmetric. It would seem then that win-strategies for the attacker (opponens) must be quite different from those that would best serve the defender (respondens). By contrast, the previous games we have studied allow the attacker and defender to change roles periodically in the course of the game. Rescher games are therefore a special case of dialectical structures. They permit less freedom of movement on one axis.

The Hintikka and Rescher games of dialectic are not developed by their designers very far in the practical

direction of coping with the fallacies. Yet in one respect they appear to be stronger and more firmly constructed than the Hamblin or Mackenzie games--the former games both have clearly stated objectives and therefore formulate win-loss rules for the participants. The lack of this type of criterion in the Hamblin and Mackenzie games tended to leave us adrift in trying to apply their rules of dialogue to the more practical subject-matter of the fallacies. To see how, let us return to a discussion of some of the rules of (H).

2.8 Strategies of Proof

There is a basic ambivalence in Hamblin's discussion (1970, p. 271) of (R1) and possible alternative rules of dialogue as means of barring circular arguments. Accordingly, we should distinguish two different possible intended meanings for the justification-request 'Why A?'. According to the first meaning, 'Why A?' means 'Give me some statement B that I, the questioner, am committed to and that implies A!'. In other words, this equivalence is appropriate. Let C(Ans) be the commitment-store of the answerer.

Why_1 A? = Produce B such that ($B \in C(\text{Ans}) \wedge B \rightarrow A$)

The arrow $\rightarrow$ stands for the appropriate consequent relation. By contrast to (1), on other occasions in dialogue 'Why A?'

means something weaker as a demand: 'Give me some statement C that I may not be committed to but that will eventually by your argument be shown to be consequent of other statements that are a consequent of B, some statement that I am committed to!' In this sense, 'Why A?' is a request for a chain of implications with B at the first point and A at the last point. By transitivity of consequence, B then can be shown to (indirectly) imply A. In this case a different equivalence is appropriate.

Why_2 A? = Produce a finite set of statements $\{P_0, \ldots, P_n, B\}$ such that $(B \in C(Ans)) \wedge ((P_0 \rightarrow A) \wedge (P_1 \rightarrow P_0) \wedge \ldots \wedge (P_n \rightarrow P_{n-1}) \wedge (B \rightarrow P_n))$

In other words, what the answerer is asked to produce is a chain, starting at B and going through possible intermediate links and terminating at A, viz. $B \rightarrow P_n$, $P_n \rightarrow P_{n-1}$, ..., $P_1 \rightarrow P_0$, $P_0 \rightarrow A$, where the possible intermediary steps are statements P_0, P_1, ..., P_n for some finite n. The n should be finite to avoid a so-called "infinite regress" during the process of working towards A.

The practical problem posed by postulating these two meanings of a justification-request in dialogue as exclusive and exhaustive is the following. As Hamblin himself notes, Why_1? restricts the game to one-step justifications as the only possible allowed response, hardly a realistic approach

to dialogue. Why_2? is much less confining in this regard, but has the other difficulty that it involves an act of faith in the other participant's direction in his line of search for proof. How can any participant know at the point of asking the original question 'Why_2 A?' whether the line of proof will ever eventually terminate in some B that is a commitment of the asker? This problem is a grave difficulty for using why_2-questions in dialectical games. A line of inquiry may be misdirected by the answerer as a "red herring" strategy without eventuating in a terminal commitment-point. Any game allowing such procedure would therefore become ungovernable by rules.

One could expect the participants to "co-operate" or "behave themselves". However, if our interest is in games of disputation, such loopholes of abuse must not be left unregulated.

One solution would be to set some arbitrary, finite number as the permissible length of the answerer's proof-chain. But the existence of such a number is not reflected in any realistic practices of dialogue. Moreover, in realistic dialogue, our patience concerning proof-excursions seems not altogether a matter, at least purely, of the length of the sequence. It also has to do with the direction the line of inquiry is taking.

In fact, whether an ostensibly wandering proof-

excursion is to be regarded as fallacious depends strongly on the objective of the game. If the win-strategy of the answer is set towards the required objective of producing some commitment-termination point of his opponent, B, then his wasting of moves (filibustering) without moving towards B in his chain of proof is to his own detriment more than to his opponent's. In the end he will simply lose the game through failure to produce such a B. The manoeuvre should in this instance perhaps better be treated not as a fallacy, or breach of a game-rule, but rather as bad strategy on the part of the answerer. If the objective is to prove-to-the-other, then failure to prove is not so much an unfair practice or fallacy against that other. Rather it is more like committing a lapse or shortcoming against oneself, or one's own case.

If the structure of formal dialogues are to reflect the practices of realistic dialogue-interchanges of proving and refuting arguments, some notion must be brought in of a participant adopting a strategy--a hypothetical sequences of moves--in order to fulfil his objective in the disputation. The answerer's objective, let us say, is to prove his thesis T_A to the questioner. In a dispute, the questioner's objective is to prove the opposite of T_A. Hence the answerer knows that the questioner is strongly committed to resist commitment to T_A. If the answerer tries to "prove"

in one step, by taking a commitment of the questioner as premiss, then one of two things will happen. If there is in fact such a B that is a commitment of the questioner and B implies A, then the answerer wins if the game is cumulative. If the game is non-cumulative, the questioner is most likely to simply retract his commitment to B, providing he sees that A is a direct consequence and A is T_A, the thesis of his opponent. Of course there may be no such B available in any event. Generally, if the particular game in question is to be of any practical interest, there will be no such B directly available to the answerer. Hence our concern with why_2-questions.

What then is the answerer to do? In a typical case, there will be no short or direct route from his opponent's commitment-set to the thesis he must ultimately prove. How should he select a chain of valid inferences as a bridge from the one point to the other?

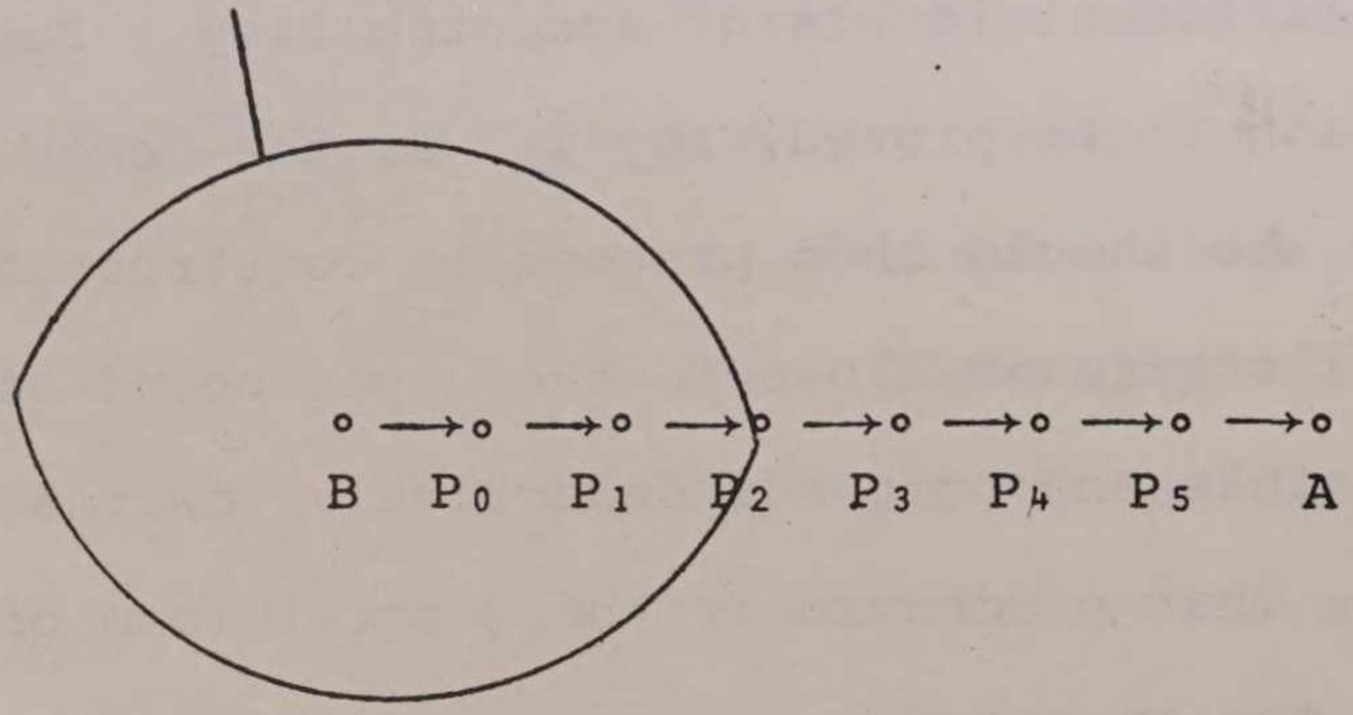
The answer is that he must adopt some sort of strategy. Typically in practice, the answerer will not know how strongly his opponent is committed to some of the statements in his commitment-store as opposed to others. But in order to adopt a working strategy to fulfil his objective, it would be useful if he could roughly order the statements he proposes to use as premisses according to how likely he thinks it to be that his opponent will accept them. He

must ask himself "Which one of the two propositions is my opponent more likely to think plausible or at least congenial to his own position?" By asking himself a series of such questions, he may be able to organize all the statements he might eventually find useful as pre-misses into different levels of acceptability. Putting his proposition to be proved, say T_A, at the lower bound of the order, he should then proceed to construct a line of proof that starts as close to the upper bound of the order as possible and proceeds deductively towards the lower bound. That procedure is the general form of a best strategy for the answerer.

Let us suppose in general that the answerer can take a set of statements, some of which are in the questioner's commitment-set and some outside it, and order this set into a number of levels. Let us say that B is a statement among those the questioner is most strongly committed to; A is the conclusion the answerer needs to prove, and is among those the questioner is least committed to, or most likely to resist commitment to. The answerer's best strategy is to select a chain of intermediate statements P_0, P_1, ..., P_n such that (i) B implies P_0, each P_i implies its neighbour to the right, and P_n implies A, and (ii) the order of P_0, P_1, ..., P_n reflects the order of the levels of acceptability of the questioner with respect to these statements, as far

as the answerer can tell. What the answerer is essentially trying to do is to extend his opponent's commitment-set in a certain direction.

Questioner's Commitment-Set



For example, suppose as above that the line of proof contains seven statements terminating in A. At the fourth step, the statement P_2 becomes the shift-point taking the questioner beyond his commitment-set. At P_3, if that step is successful, the answerer has created a new member in his opponent's commitment-set. The answerer tries to extend his opponent's commitment-set beyond P_2 and through to A.

Notes: Chapter Two

[1]Other examples are given in Woods and Walton (1982).

[2]Indeed there is a sense, noted by Woods and Walton (1978, p. 80), in which White might be said to be inconsistent. At step (3), White's commitment-store contains A and A ⊃ B, yet he retracts his commitment to B. Yet it would seem that if White is to be consistent in his retractions, having retracted B he should also retract either A or A ⊃ B or both. Despite the fact that White moves back to consistency by conceding B at (4), his retraction at (3) remains a strange sort of move.

[3]By the Challenges rule, Bob is not committed to P at step n of the second circle-game above. However, at step n+1, he becomes de facto committed to P, because P is a consequence of Q and 'If Q then P'. Here is an instance then where a player is not committed to a statement that he is at the same dialogue-stage de facto committed to.

[4]Alfred Tarski, Logic, Semantics, Metamathematics, Oxford, Clarendon Press, 1956.

[5]See P. Linwood Urban and Douglas N. Walton (eds.), The Power of God: Readings on Omnipotence and Evil, New York, Oxford University Press, 1978.

[6]Mary Anthony Brown, 'The Role of the Tractatus de Obligationibus in Mediaeval Logic,' Franciscan Studies, 26, 1966, 26-35.

[7]See Brown op. cit., p. 28.

[8]It is proposed (p. 4) that there is a third party called the determiner who presides as a "referee" or "judge" over the dispute. However very little use or mention is made of this party in the subsequent account of the structure of disputation.

[9]These concepts are more fully outlined in Woods and Walton (1975).

[10]This prohibition seems drastic, but might be reasonable in the context of a particular game designed for certain specific purposes.

CHAPTER THREE: STRATEGIES AND OBJECTIVES

The basic problem with the Hamblin-Mackenzie games is that they do not provide enough incentive to the answerer to make commitments. If the answerer replies 'No commitment' to every question, he can successfully block all the questioner's attempts to deploy strategies by building up a set of his opponent's commitments. By such a ploy, the answerer can always win out in the end or at least prevent the questioner from winning. Such a game is therefore too one-sided to generate interesting strategies.

One way to solve the problem is to allow the questioner to ask yes-no questions without allowing the answerer the 'No commitment' option.[1] This feature would force the answerer to a question 'A?' to reply 'A' or '¬A', allowing him no option other than these two. Hence one way or the other, he would have to make some form of commitment.

But this solution, in effect, builds a form of the <u>ad ignorantiam</u> fallacy right into the structure of the game. If the answerer has no evidence in favor of A, he is forced to conclude that A is false, i.e. to answer '¬A'. If he has no evidence against A, he is forced to conclude that A is true, i.e., to answer 'A'. If he has no evidence

at all, one way or the other, he is forced to commit either the one form of fallacy or the other. Hence this solution still leaves us with a similar sort of problem, although it does occur in a somewhat milder form by distributing the burden inequitably the other way around. This time it is too easy for the questioner and too hard for the answerer. The questioner can quickly build up big stocks of commitments that the answerer is in reality only very mildly committed to. Thus it will be very easy for him to produce winning strategies unless the answerer is a very skillful player with an impeccable memory.

However, this type of game could be fair if players take turns asking and then answering questions, and both players can ask yes-no questions with no 'No commitment' option open. The questioning would be unusually aggressive, but there could be enough equity to result in interesting strategies if both sides could so question.

3.1 Symmetric Games with Equitable Win-Rules

Another way to allow 'No commitment' answers yet deal fairly with the problem of the answerer who refuses ever to commit himself is to allow points for incurring commitments. We can do this by adopting the following rule. Every time an answerer makes a commitment in answer

to a question, he receives one commitment-point. Then if neither party has successfully proved his thesis after an agreed-upon finite number of moves, the player wins who has the most commitment points. Or if both players have proved their theses in the same number of moves--a tie game--then the one with the greatest number of commitment-points is declared the winner.

This solution presumes that both players have equal chances to incur commitments. In fact it would seem most suitable where each takes turn asking and answering questions.

There still remains in at least one instance a certain disincentive to making commitments. This situation occurs where it is clear to one player that he has a win-strategy that must work to prove his thesis before the game terminates, and where he knows that the other player does not have a win-strategy that can tie or beat his. In this situation, the player with the win-strategy should not make any further commitments. He should henceforth always answer 'No commitment' to any question. Reason: he now has nothing to gain by increasing his commitment-points.

Thus this solution still retains a certain encouragement to skeptically steer clear of commitments on the part of an answerer. But the disincentive is here more

limited, and therefore is much less of an undermining of interesting play.

One place where strategy does come into the Mackenzie games is in the notion of de facto commitment. According to Mackenzie (1979, p. 123), a player is committed de facto to a statement Q if he is committed to P and 'If P then Q' for any P, regardless of whether 'If P then Q' is an immediate consequence conditional or not. What Mackenzie means by 'Bob is de facto committed to P' however, does not necessarily imply that P is one of Bob's commitments. Rather, he means that Bob is liable to a resolution demand if he denies, withdraws or challenges P.

De facto commitment is therefore closed under logical consequence generally. According to Mackenzie (1979, p. 123), "if Bob is committed to a statement and also to a sequence of conditionals linking it to some remote consequent, then he is de facto committed in this extended sense to that remote consequent." Furthermore, Mackenzie notes that his justification for introducing such a notion is that it offers Bob's opponent a strategy culminating in a resolution demand should Bob deny, withdraw or challenge this statement that is a remote consequence of statements he had previously indicated commitment to. However, the underlying purpose of such a "strategy" is not made clear by Mackenzie. Bob's opponent

can challenge him to straighten out his inconsistencies of commitment, even those of the remoter sort. But the ultimate objective of carrying through a longer sequence of immediate consequence conditionals in order to tidy up some of Bob's messy inconsistencies is not set down for Bob's opponent. Yet it is suggestive that the word 'strategy' is at least briefly alluded to here.

We need to make a clear distinction between two types of rules. One type is a structural rule--this is a kind of rule that determines the structure of the game, and in effect defines the game itself. These include rules indicating permissible moves, like the asking or answering of questions, rules stipulating which inferences are valid and which are not, and rules determining what sequence of moves by a player constitutes a win or loss. The other type is the rule of strategy or strategic rule. These rules indicate to a player certain patterns of moves that constitute good or bad strategy. A bit of bad strategy may lose a player the game. But then again it may not--in some situations it may merely worsen his chances of winning. Bad strategic moves violate no structural rule of the game. Rather they represent moves or sequences of moves that are less than optimal in helping a player to prove his thesis or win the game.

One of the most valuable services of games of logic

as a tool for the analysis of informal fallacies is the sharp formulation of this distinction in relation to a game. With many of the so-called fallacies, it is unclear in practice whether the error being identified is supposed to be a deeper infringement of some fair procedural guideline and hence an unfair move against your opponent, or rather more of a confused or inept way of building your own case. In the latter interpretation, no transgression sharply pre-empting your supposed opponent's fair play need be involved. In many ways, bad strategic moves are more likely to be a disservice to your own case rather than to your opponent's.

We sometimes have a choice in constructing a game of dialogue whether to build in the prescription of a "fallacy" as a violation of a structural rule or of a strategic rule. Making this choice forces us to be clearer in modelling precisely what we think is wrong about this "fallacy".

Before going any further however, we should look at an example.

3.2 Republic of Taronga

Two foreign affairs specialists in economics are having a discussion about possible future economic

developments in the Republic of Taronga. Both agree that if inflation stops in Taronga and there is wage-price control, then there will be a depression. But they sharply disagree about other assumptions concerning the situation in Taronga. First, they disagree concerning the nature of the relationship between inflation and wage-price control. Black thinks that if there is wage-price control, then inflation will stop. That is, he argues that wage-price control is a sufficient condition for the cessation of inflation. White does not wish to venture to claim that Black's way of looking at it is entirely wrong, but sees the relationship the other way around. He feels that wage-price control is necessary to stop inflation in Taronga. What he asserts is: if inflation stops in Taronga, then there will have been wage-price controls set into effect. In this regard then, Black and White don't wholly reject the position of the other, but are inclined to see the direction of the relationship differently. However, in another respect, they are wholly at odds. White is inclined to predict that free fluctuations in economic policy-making will continue in Taronga. But Black flatly disagrees. He thinks that such fluctuations will not continue.

The reason Black and White are involved in this discussion is that they have been asked by government

policy-makers to advise on the question of whether or not there will be wage-price control in Taronga. But their problem is that they sharply disagree on the question. White's thesis is that there will be no wage-price control in Taronga. Black is diametrically opposed, strongly inclining towards the thesis that there will be wage-price control. Their argument seems to be going in circles and they can't seem to advance beyond the stage of identifying the agreements and disagreements above. Yet they need to arrive at a decision, or at least resolve their disagreement.

In the dispute between White and Black, there are four basic propositions that are involved. With some allowances for shifts of tenses and other minor details, let us represent these as follows.

A : Inflation will stop in Taronga.

B : There will be wage-price control in Taronga.

C : There will be a depression in Taronga.

D : Free fluctuations in economic policy-making in Taronga will continue.

The commitments of each in the present stage of the dispute can be outlined as follows.

	BLACK'S COMMITMENTS	WHITE'S COMMITMENTS
1.	$B \supset A$	$A \supset B$
2.	$(A \wedge B) \supset C$	$(A \wedge B) \supset C$
3.	D	$\neg D$

At 3. they flatly disagree, at 2. they fully agree, and at 1. they differ but do not disagree (at any rate, flatly). White's thesis, or conclusion to be proven, is $\neg B$. Black's thesis to be proven is B. In this sense the issue is one of direct opposition.

From our description of the discussion so far, it seems that each is strongly enough committed to the assumptions above that neither is likely to budge simply to accommodate the other if questioned directly. Now as it happens, none of the other economists or foreign-affairs officers in the department is as knowledgeable as these two on the topic of the Tarongan economy. Therefore, to try to find out as much as possible from these two, the head of the department decides to have them engage in a debate or contestive discussion, which she will referee.

The problem is now posed: what strategy should each player adopt in order to win the disputation? In arriving at a strategy, both participants first should observe that the opponent's argument is not deductively valid as it stands.

WHITE	BLACK
$B \supset A$	$A \supset B$
$(A \wedge B) \supset C$	$(A \wedge B) \supset C$
D	$\neg D$
$\neg B$	B

The values below show that in each argument the premisses can all be true while the conclusion is false.

A	B	C	D
T	T	T	T

A	B	C	D
F	F	T	F

Let's say also that each player recognizes that the other is unlikely to be persuaded to accept one or more of the basic propositions, A, B, C, or one or more of their negations, $\neg A$, $\neg B$, or $\neg C$. So each should recognize that a good strategy would be to "connect" D to A, B, or C, or some combination of these three, in a manner that would yield premisses acceptable to one's opponent enabling a deduction of one's own thesis.

As a first pass, Black might consider $\neg D \supset B$ as a connecting premiss, but he sees that the move is too transparent to seem attractive to White. Similarly, White might consider and reject $D \supset \neg B$. In both instances, the player's

conclusion is an immediate consequence of a single premiss of his opponent's premiss-set. As a strategy then, such an attempt would be too obvious. If you are on your guard against too easily accepting your adversary's conclusion, you are not too likely to accept an assumption that directly implies it, taken together with one of your strongly affirmed premisses.

Let us say that Black and White have agreed that a number of rules of classical deductive logic shall govern the logical moves permitted by either player in the game. Suppose they adopt the following set of rules.

$S \supset T$, S, therefore T : Modus Ponens (MP)

$S \supset T$, therefore $S \supset (A \wedge T)$
$S \supset T$, therefore $S \supset (T \wedge S)$
} Absorption (Abs.)

$S \supset T$, $T \supset U$, therefore $S \supset U$: Hypothetical Syllogism (HS)

$S \supset T$, $\neg T$, therefore $\neg S$: Modus Tollens (MT)

By these rules, Black could win if he could get White to accept $\neg D \supset B$, and White could win if he could get Black to accept $D \supset \neg B$. But these premisses are, as we saw, in some sense "too obvious" for one's adversary to be likely to accept.

Given the nature of the problem posed, we can now see how structural rules for playing the game are different from strategic principles that one should adopt in

order to win the game. The inference rules above are structural rules. Another appropriate type of structural rule might be the following: if your opponent has a set of commitments such that you can show that some statement follows from those commitments by one application of one rule of inference, then your opponent is committed to that statement. This principle is one of immediate closure of commitments under the rules of inference of the game.

But immediate closure presents a strategic problem. Any disputant who perceives that his opponent's thesis follows directly by one or more "obvious" applications of the rules from a set of premisses will do all he can to avoid incurring commitment collectively to that set of premisses. So White and Black each have a strategic problem. Could there be principles or rules of strategy that they could apply to their respective problems?

Notice that the game, as we have filled in the practical background for it, is portrayed as a disputation. This means that what is not needed is for both players to simply drop the premisses they disagree on, and pool together on their agreements. This solution would be the collective pooling or information-gathering approach. Instead, White and Black want to fight it out. What is needed is to see whether, in some regulated and fair way, one can impose his assumptions against the argument of the other. That is the

problem set.

Could the answer to White and Black's strategic problem lie in the observation that each needs premisses that are not "too obvious" to his adversary? If so, the solution is to find premisses that are more complex, or more indirectly connected to B. Pursuing this line of approach, Black should perhaps select as a premiss to gain White's commitment to: $(A \supset C) \supset (D \vee B)$. Similarly, White could try to get Black to accept $D \supset \neg(B \wedge C)$. Then each would have a best win-strategy as given below.

WHITE		BLACK	
1. $B \supset A$	Com Black	$A \supset B$	Com White
2. $(A \wedge B) \supset C$	Com Black	$(A \wedge B) \supset C$	Com White
3. D	Com Black	$\neg D$	Com White
4. $D \supset \neg(B \wedge C)$	Com Black	$(A \supset C) \supset (D \vee B)$	Com White
5. $\neg(B \wedge C)$	4, 3, MP	$A \supset (A \wedge B)$	1, Abs.
6. $B \supset (A \wedge B)$	1, Abs.	$A \supset C$	5, 2, HS
7. $B \supset C$	6, 2, HS	$D \vee B$	6, 4, MP
8. $B \supset (B \wedge C)$	7, Abs.	B	7, 3, MT
9. $\neg B$	8, 5, MT		

Clearly then a general structure rich enough to accommodate strategic considerations is a next step.

3.3 Dialectical Systems

Although there may be many particular types of games, every game has a characteristic set of components. In virtue of having these components which we will now describe, the game may be said to have the structure of a dialectical system. The concept of a dialectical system as outlined below will be essentially similar to the same notion of Hamblin and Mackenzie, the main exception being the addition of a strategic component defining win-loss requirements.

(1) The Set of Players. There will be a set of players, two, α and β, in the simplest case.

(2) The Set of Locutions. The basic category of locution is that of the statement. Capital letters, S, T, U, ..., will be used as sets of statements when setting up the rules of the game. Instances of S, T, U, ..., in a particular game will be denoted by statement-letters A, B, C, ... Two specially designated members of the set of statements are T_α, the thesis α is set to prove, and T_β, the thesis β is set to prove. Other types of locutions include questions and statements like 'No commitment S'. For each game, the notion of 'consequence' and other relevant notions will be defined by building a propositional calculus into the set of locutions. A question of the form 'S?' directs the answerer to commit himself either to S or to the negation of S (or possibly to indicate 'No commitment S' in some games). A question of the form 'Why S?' directs the answerer to furnish some statement T that implies S. Hence 'negation' and 'consequence' must be defined in games with both types of questions.

(3) Commitment Rules. The commitment rules indicate how appropriate additions and deletions are made to the participants' commitment-stores when a player moves by each form of locution. As in Hamblin and Mackenzie, each player has a set of statements called his commitment-set. Each move may add statements to that set, or if retractions are allowed in a particular game, delete statements from the commitment-set. The 'logic element' (propositional calculus) from (2) allows precise rules to be formulated governing the extent of both closure under consequence and consistency in the commitment-set. In some games, consistency or closure under consequence may not be required at all.

(4) Rules of Dialogue. The rules of dialogue define the admissible 'next moves' for any move by the opposing player. Examples are R_{Chall} or $R_{Resolve}$ in DC or Hamblin's syntactical rule S3 of (H). Some of the dialogue rules of DC, e.g. $R_{Repstat}$ would not be classified here in (3) as dialogue-rules. I prefer to think of a rule like $R_{Repstat}$, for example, as a commitment-rule.

(5) Strategic Rules. A player (say α) wins if he shows by the rules that his opponent's (say β's) commitments imply his own thesis (T_α). One player wins if and only if the other loses. In an alternative to this win-loss principle, the following one is also possible: a player wins if he shows by the rules that his opponent's commitment-store is inconsistent, or is inconsistent with his own (the opponent's) thesis. These win-loss principles are nearly equivalent if the logic element from (2) is classical logic, where an inconsistent statement implies any statement you like. But in certain games with a non-classical logic element, the two principles are farther apart. In these non-classical games, the two principles characterize two different types of games.

A few more comments about the role of strategic rules in dialectical systems are now in order. We said above that the player (say α) wins who shows that his opponent's (say β's) thesis (T_β) is a consequence of β's commitment-set. However, there is a certain practical difficulty inherent in this formulation: β could adopt the strategy of never making any commitments (play the skeptic). One way around this difficulty is to force β to always make a choice of exactly one of the pair {A, not-A} when asked a question 'A?'. The proposal is in effect to design the rule of dialogue for question-asking to exclude the possible response, 'No commitment A'. However, as we have seen, this proposal may make it problematic to deal with the Fallacy of Many Questions or other question-asking fallacies. Hence, generally our alternative proposal is better: one can rule that β wins if he has some agreed-upon finite number of commitments. This way β is encouraged to make commitments and α is encouraged to plan a win-strategy in a fairly short sequence of moves. More generally, the following rule seems appropriate. Pick some particular number of moves k that should be large enough to allow both players scope for strategies. Whoever proves his thesis at or before k wins the game, or if neither player has proved his thesis, then the one with the greater number of commitments wins.

A set of moves is, as in Hamblin and Mackenzie, a set of ordered pairs of locutions and participants. A winning strategy is a set of moves such that there exists a set of commitments of one's opponent generated by those moves, and one's opponent's thesis is a consequence of those commitments.

3.4 The Game CB

In playing Republic of Taronga, and in light of previous discussions of game rules, it has begun to emerge that a particular type of game of a certain set would be a good place to start. It should have strategic rules but should also incorporate structural rules of the Hamblin and Mackenzie games. It should thereby also represent an extension of the Hintikka and Rescher games, by having the formulation of criteria for winning and losing. But it should retain some of the well-formulated locution-rules, dialogue-rules and commitment-rules of (H) and DC. It will give us a starting point. By studying its modifications and extensions, we can carry on our discussion of the fallacies in a more precise and orderly way.

The game outlined below is a minimal one, a sub-game of (H) and DC. It does not allow the complex questions, statements, and commitment-statements of (H), nor

the commitments to challenges of DC. It is minimal in these respects because it is designed to study strategies of proof only, especially with respect to retraction of commitments.

In the game CB, the logic element is classical propositional calculus. There is a non-empty set of rules of inference in the game. These will be the usual sorts of rules for classical propositional logic, e.g. modus ponens. Other than that it doesn't matter too much which rules are chosen provided the players agree on a specific set. To avoid premature complications however, it may be better to avoid rules that allow infinite repetitions like 'S, therefore S ∨ T'. A statement T is an immediate consequence of a set of statements S_0, S_1, ..., S_n if and only if 'S_0, S_1, ..., S_n, therefore T' is a substitution-instance of some rule of the game. A statement T is a consequence of a set of statements S_0, S_1, ..., S_n if and only if T is derived by a finite number of immediate-consequence steps from immediate consequences of S_0, S_1, ..., S_n.

The Game CB

Locution Rules

(i) Statements: Statement-letters, S, T, U, . . ., are permissible locutions, and truth-functional compounds of statement-letters.

(ii) Withdrawals: 'No commitment S' is the locution for withdrawal (retraction) of a statement.

(iii) Questions: The question 'S?' asks 'Is it the case that S is true?'

(iv) Challenges: The challenge 'Why S?' requests some statement that can serve as a basis in proof for S.

Commitment Rules

(i) After a player makes a statement, S, it is included in his commitment-store.

(ii) After the withdrawal of S, the statement S is deleted from the speaker's commitment-store.

(iii) 'Why S?' places S is the hearer's commitment-store unless it is already there or unless the hearer immediately retracts his commitment to S.

(iv) Every statement that is shown by the speaker to be an immediate consequence of statements that are commitments of the hearer then becomes a commitment of the hearer's and is included in his commitment-store.

(v) No commitment may be withdrawn by the hearer

that is shown by the speaker to be an immediate consequence of statements that are previous commitments of the hearer.

Dialogue Rules

(R1) Each speaker takes his turn to move by advancing one locution at each turn. A no-commitment locution, however, may accompany a why-locution as one turn.

(R2) A question 'S?' must be followed by (i) a statement 'S', (ii) a statement 'Not-S', or (iii) 'No commitment S'.

(R3) 'Why S?' must be followed by (i) 'No commitment S' or (ii) some statement 'T', where S is a consequence of T.

Strategic Rules

(i) Both Players agree in advance that the game will terminate after some finite number of moves.

(ii) For every statement S accepted by him as a commitment, a player is awarded one point.

(iii) The first player to show that his own thesis is an immediate consequence of a set of commitments of the other player wins the game.

(iv) If nobody wins as in (iii) by the agreed termination point, the player with the greatest number of points wins, or the game is a draw.

What sort of strategy should a player, let's say α, adopt in order to win over β in CB? He must look around for premisses that β will accept such that these premisses imply T_α, his own thesis to be proved. But the initial problem for α is that if he simply asks β to accept premisses that directly imply T_α (where T_α is a direct consequence of these premisses), β is not likely to accept them. There are a small number of rules of inference known by both players, so β is not likely to be so foolish. Suppose there is some proposition A that implies T_α by a single application of a rule of the game. It would seem prudent to assume that β knows that if he accepts A, he loses the game (in one move). Hence asking β to accept A would not be particularly good strategy for α, unless he thinks β is very obtuse, or perhaps does not understand the rules very well.

In this type of situation, several strategies are available to α. One is the strategy of presenting premisses separately (divide and conquer). Another is to "spread out" the proof between A and T_α with a number of intermediate steps. We might call these kinds of strategies respectively

dividing and spreading. The first seems to work because arguers are not always consistent--they may forget their previous commitments, fail to compare "newer" commitments with "older" ones, or otherwise fail to take into mind their whole commitment-set in relation to the strategy of their next move. The spreading strategy seems to work because arguers are sometimes non-omniscient with regard to the logical consequences of their commitments. Played against a computer with perfect logic and memory, these strategies would be of no avail. However, in practice, enough arguers are less far-seeing and less careful in remembering to make these strategies of interest.

A win-strategy for a player may be defined in a dialectical system as a proof that terminates in the thesis of that player. A proof is a sequence of steps of immediate inference where each step is in accord with the rules of inference, and each step is an answer to a why-question.

As an example of a strategic problem, suppose that α is set to prove $B \vee D$ as his thesis. Suppose α decides to prove $B \vee D$ by means of an initial strategy that has the form of a dilemma.

$$\frac{\begin{array}{l} A \supset B \\ C \supset D \\ A \vee C \end{array}}{B \vee D}$$

Suppose β accepts A $\vee$ C and then accepts C $\supset$ D. Only one needed premiss remains, A $\supset$ B. This premiss could now be called the corner for α's proof. The problem is that α thinks that β will not accept A $\supset$ B, because β knows the above form of argument is valid and will "smell a rat" if A $\supset$ B is put to him directly. Hence α must adopt a dividing or spreading strategy, or some combination of the two. For example, he might try to get β to accept A $\supset$ E and E $\supset$ B, where 'S $\supset$ T, T $\supset$ U, therefore S $\supset$ U' is a rule of the game (combines dividing and spreading).

Interestingly, it would seem to be an additional principle of good strategy for α to select as corner the premiss he thinks β will find most plausible. This is so because β is most likely to resist the corner (the last premiss needed by α). Thus contrary to strategies appropriate to some games, in CB it is best to order your argument with the least plausible premisses first, proceeding towards the most plausible premiss as the last one to be presented.

3.5 Attack versus Defence Strategies

So far we have been discussing the attacker's strategy of the player who wants to prove his thesis. What about the defender's strategy who wants to repel such a proof? The attacker wants to find a corner, a statement that will, together with previous commitments of the opponent, imply the

attacker's thesis by the rules. Accordingly, we should enunciate the attacker's corner principle of strategy: get your opponent committed to a set of statements that yield a corner that is not too unacceptable to your opponent. Then part of the attacker's strategy is achieved. To carry out further strategically sound moves, the attacker should then use spreading or dividing strategies to fill in the corner.

In games of dialogue however, each player is aware of the moves of the other player. This means that if one perceives the other's strategy, he may take steps to counter it. In that case however, the first player may also perceive his opponent's attempts to block his strategy, and take that into account in modifying his strategy.

One elementary strategic principle for the defender is the loophole or way out principle: do not become committed to any corner. In other words, the loophole principle advises you to reject, or at least be sure not to accept, any statement that, together with other statements in your commitment-store, directly or indirectly implies your opponent's thesis. If you see a corner, reject it! Otherwise you may lose the game.

Hence we can see why it is advisable, to a certain extent, to assume that the other player is "rational". You should presume that the other player may perceive your

attempts to win, if you are an attacker. So you should try to adopt strategies that the other player is not too likely to perceive as strategies.

These notions of attack and defence seem highly applicable to the ad hominem disputes we studied in chapter one. There, the attacker was trying to achieve a certain kind of logical closure in the defender's position, or commitment-set. However, the kind of "closure" was quite different in the case of ad hominem argument from the strategies of CB. In an ad hominem attack, the objective of the attacker is to show that the position of his adversary is inconsistent.

In the game CB, the objective was to prove your thesis for each player, and once you do that you win. However a game similar to CB could be constructed, except that in the new game, CC, the objective is to prove that your opponent's commitment-store contains an inconsistent set of statements. Then a third game can be constructed, CBC, that contains the previous two. In the third game, the objective is to win either by proving your own thesis or by finding an inconsistency in the opponent's position (his set of commitments). Under certain assumptions all three games turn out to have equivalent strategies. These assumptions may be that the rules of the game are strong enough to be a complete set of rules for classical propositional

calculus, or at any rate strong enough to allow a player to prove any statement from an inconsistent set of premisses. A theorem about games and strategies is worth stating in this connection.

Theorem 1: In any logical game that has disjunctive syllogism and addition as rules, trapping your opponent into a directly inconsistent pair of commitments amounts to a proof of your thesis.

Proof: Assume your opponent is committed to A and also to ¬A. By addition, he must be committed to A ∨ B if he is committed to A. By disjunctive syllogism, he must be committed to B if he is committed to A ∨ B and ¬A. Hence if he is committed to an inconsistent pair, A and ¬A, then by two steps of argument he can be forced to concede B, any proposition whatever, even one unrelated to A in any way. In particular, B can be your own thesis.

Corollary: If the commitment-set is inconsistent (but not directly), there is an effective strategy for proving your thesis.

We say "amounts to" in the statement of theorem 1 because there may be a number of steps between proving inconsistency and proving your thesis. With a finite move-limit on the game as in CB, therefore, you may be able to win (in certain instances) by one strategy but not the other. Hence the two strategies are nearly equivalent but not completely equivalent. They are completely equivalent if we make a stipulation about the number of remaining moves open to the attacker.

The converse of theorem 1 also obtains in the special case of a dispute, where the defender's thesis is the immediate opposite of the attacker's thesis (provided the defender is committed to his own thesis). The attacker wins by proving his thesis and thereby the defender becomes committed to both his own and the attacker's thesis (an inconsistent set). Hence,

Theorem 2: In a dispute, proving your thesis amounts to trapping your opponent into inconsistent commitments.

It is interesting to note that theorem 1 will not apply to certain non-classical classes of games. For example, in a game with relatedness propositional calculus as a logic element, addition cannot be a valid rule of inference for any statements. Hence in this type of game the strategy of

proving your thesis from your opponent's commitments tends to diverge from the strategy of finding an inconsistency among your opponent's commitments. In these games, the one strategy is less nearly equivalent to the other, with the result that attacker's and defender's principles of strategy become quite different in certain respects. Relatedness logic is quite sensitive to spreading strategies, and in fact enables us to articulate some special attacker's strategies.

Distancing Strategy: Get your opponent to concede something that bears no relation at all to the thesis at issue. Then connect it to the thesis at issue. Then fill the loophole you have created.

Example:	$A \supset B$	Bears no connection to thesis.
	$A \vee C$	Connection to thesis made.
	$\neg B$	Loophole filled.
	C	Thesis.

The above strategy can be improved in practice by working obliquely towards filling the loophole. For example, suppose A = Albert did it, B = Bob did it, C = Charlie did it. First, you get your opponent to concede the first two premisses, $A \supset B$ and $A \vee C$. Then you ask him to accept 'If Bob had an

alibi, then Bob didn't do it.' (D ⊃ ¬B). Finally, you ask him to concede that Bob had an alibi. The sequence of commitments would now be (1) through (4) below. The best proof-strategy is given below.

1.	A ⊃ B	
2.	A ∨ C	
3.	D ⊃ ¬B	
4.	D	
5.	¬B	3, 4, MP
6.	¬A	1, 5, MT
7.	C	2, 6, DS

Both distancing and spreading strategies have to do with the relation of "closeness" of one statement to another. In spreading strategies, it is the number of moves between acceptance of a pair of statements by the opponent that is critical. In distancing strategies it may be that factor, but is perhaps more likely to be other factors that make for closeness of a pair of statements. For example, the subject-matter overlap between two statements may be the factor that makes for the perceived closeness of two statements.

To see the general form of a distancing problem in an attacker's strategy formation, consider a dialogue-game where α is set to prove A and β is set to prove B. Let's

say α is already committed to A ⊃ B, and β is already committed to B ⊃ A. Take β as an example of an attacker. β needs to get α to accept A, to prove B by the rules. Let's say the only rule is <u>modus ponens</u> for the classical conditional.

Of course if β asks α to accept A, he won't get it, assuming α is familiar with the loophole principle and its application to the present game. By distancing, β should pick some other statement C, not related to A or B, and try to get α to accept C and C ⊃ A. Even better, by a tactic of spreading, β should find some D not related to A, B, or C, and try to get D and D ⊃ C before trying to get C and C ⊃ A. Adding a few more unrelated statements E, F, G, H, and I could produce an even more sophisticated strategy-tree.

<u>Strategy Tree for β (Attacker)</u>

The general strategy implicit in constructing a strategy-tree like the example above involves all three strategies of spreading, dividing and distancing. At each higher level of spread, the attacker should pick statements C, D, E, ..., so that at least some of these statements are not related in subject-matter to A. Thus he secures distancing as well as spreading and dividing.

Finally, we shall make one general remark about the curious relationship between strategies and rules in games of dialogue, and then indicate yet another strategy for the attacker. Then perhaps we will have given enough information on attack and defence strategies to yield a general picture of how they work.

The game CB has as its win-objective to prove your own thesis. It also had a commitment rule (iv) that all immediate consequences of a player's commitments also become his commitments. But suppose we have a game called CBD, like CB except that an additional win-objective is to catch a player in direct inconsistency of commitment. We shall say that a player is <u>directly inconsistent of commitment</u> if and only if (i) he is committed both to some statement S and also to the negation of S, or (ii) he has indicated at some move that he is committed to S and at another move that he is not committed to S. The following defence strategy holds for CBD.

Strategic Defence Principle: Always accept all direct consequences of your commitments.

Otherwise, your opponent can trap you into direct inconsistency of your commitments, and win the game on the next move. But notice now that given the defence principle above in CBC, rule (iv) is no longer needed! What was a commitment rule of the game now, in effect, becomes incorporated into strategy. Why? It is because the win-objective has been shifted. Thus in the logic of dialogue, game rules and strategic rules have curious connections. One further strategy, this time an attacker's strategy, should be given special attention.

Attacker's Strategy: Sometimes you can spread commitment over a set of propositions by disjunctions so that even if your opponent won't accept each proposition individually, he might be led to accept the whole set. And you can still use the set as a corner filler.

Example: Suppose you want your opponent to accept B but your opponent does not want to accept B. Say it is your thesis. If you use the argument on the left below, he will reject A. His reason: he rejects B, therefore once he is

aware of $A \supset B$ as a commitment, he will reject A.

$$\frac{A \supset B \qquad A}{B} \qquad\qquad \frac{A \supset B \qquad C \supset B \qquad A \vee C}{B}$$

So you try again. Given the first two premisses, your opponent who rejects B is disinclined to accept each of A or C, taken separately. But he may be less disinclined to accept the weaker proposition $A \vee C$. The argument on the right is a form of dilemma.

General Strategy: Try to get commitment to a set of conditionals with antecedents that can be disjoined into a plausible proposition, and where the consequent of every conditional is the proposition you want to prove (T below).

$$\frac{\begin{array}{l} A_0 \supset T \\ A_1 \supset T \\ \quad \vdots \\ A_i \supset T \\ A_1 \vee A_2 \vee \ldots \vee A_i \end{array}}{T}$$

This could be called the strategy of thinning plausibility over a disjunction.

3.6 Relative Depth of Commitment

Before we can apply our new ideas of dialectical strategies any further to our study of the fallacies, we need to add one new notion to dialectical systems. Previously, we have assumed that any player is always committed to a statement or not. We have not yet toyed with the complication that over his position, a player may be more centrally or deeply committed to some statements than to others. However, the idea is not a new one--Quine has introduced us to the notion that some statements in the network of an arguer's position may be more centrally located, less prone to revision or removal in the face of inconsistency.

Rescher (1976) has also developed the idea that a proposition can be plausible, even if it is not known to be true or probable, if there is a certain burden of proof in favor of retaining it as a reasonable presumption. The task of plausibility theory, as Rescher sees it, is to help us carry on an orderly process of reasoning in the face of inconsistent data. In the interest of consistency, some information must be "given up". Neither the probability calculus nor classical deductive logic are very helpful in

telling us how to proceed when confronted with inconsistency. In classical deductive logic, given an inconsistency you can derive any statement you like. In the probability calculus we have it that:

$$\text{pr(q given p)} = \frac{\text{pr}(p \wedge q)}{\text{pr}(p)}$$

So if p is inconsistent, Pr (p) = 0, and Pr (q given p) cannot be defined. We cannot determine probabilities relative to an inconsistent given. Yet inconsistency needs to be dealt with in dialogue. We have seen why, especially in light of the ad hominem and ad verecundiam types of arguments.

The central methodology of plausibility evaluation is essentially given by six rules which tell us how to obtain what is called a "plausibility indexing". The rules are quite simple. They are, as Rescher says, more designed for comparing rather than calculating. This simplicity is however appropriate for a level of analysis that is more basic, or even more primitive, than say, probability theory, we are told. We start with a set S = $\{P_1, P_2, \ldots, P_n\}$ of propositions that represents a set of theses we are inclined to accept. These data for plausibility theory are taken to be propositions that are "vouched for" by sources, e.g. experts, eyewitnesses, historical sources, conjecture, or

even principles such as simplicity or uniformity. Degrees of plausibility are indicated on a scale, 1, $\frac{m-1}{m}$, $\frac{m-2}{m}$, ..., $\frac{1}{m}$ where 1 represents maximal plausibility and $\frac{1}{m}$ represents minimal plausibility for $m > 0$. The plausibility indexing is a value $|P|$ such that $0 < |P| \leqslant 1$. Then the six rules are as follows. (P1) Every $P_i \in S$ gets a value $|P|$. (P2) Logical truths get the value 1. (P3) All the logical truths must be consistent (and also "materially consonant", i.e. logically consistent with "certain suitably fundamental stipulations of extra-logical fact" (p. 15, note 1). (P4) If $P_1, \ldots, P_j \vdash Q$ for mutually consistent $P_1, \ldots P_j \in S$ and $Q \in S$, then $\min |P_i| \leqslant |Q|$. (P5) It is possible that both P and ¬P (the negation of P) should be highly plausible, e.g. .9. (P6) In a conflict within S, the more highly plausible P_i is to be retained. (P1) represents the idea that we are only concerned with claims that have some plausibility, even if it is only a little. $|P_i| = 0$ if P_i is utterly implausible, if P_i has no plausibility. (P2) and (P3) are fairly obvious in their intent. (P4) represents the key idea of plausibility theory that a conclusion cannot be less plausible than the least plausible premise of a deductively valid argument. (P5) means that, for example, in a detective story it might be plausible from reliable testimony both that the butler did it and (even where it is not possible that both did it) that the chauffeur did it. This feature decisively

distinguishes plausibility from probability. (P6) is the rule that enables us to deal with the basic problem for plausibility theory, the restoring of consistency in the case where S is found to contain an inconsistency.

The question of deductive closure of S is especially interesting. Since plausibility theory is mainly designed to deal with an inconsistent p-set S, inferential closure would make the enterprise absurd. However, in the special case where S is consistent, Rescher extends the plausibility-indexing to cover its deductive closure Sc (set S plus all its deductive consequences). The rule of thumb here to determine the plausibility of some proposition P in Sc amounts essentially to this: take all the sets of S-propositions that entail P, determine a plausibility-indexing for each set based on the least-plausible-premise rule, then pick the maximum of these values. Rescher calls this case the special (artificial) source of reasonable inference, X*. Practically speaking, in connection with evaluating the pronouncements of authorities, this feature can be quite important for, as DeMorgan (1847) observed, authorities are not always quoted directly so that in practice we are often confronted confusingly with what is taken to be an inference from the original pronouncement. What often happens may begin something like this. Authority a asserts p and then individual b infers that q. Next, c credits a

with q. And so forth. We need not go too far in order to see how it can be dangerous indeed to confuse 'what a source is thought to have actually said' with 'what is thought to be inferrable from what was said.'

For our preliminary discussions of strategy in the sequel, we do not need to make assumptions about plausibility as strong as Rescher's six conditions. To begin with, all we need is the idea that a player can in some cases rank an opponent's pair of commitments with regard to that opponent's relative depth of commitment to them.

3.7 Strategy Sets

To adopt a strategy, one must first of all gain some preliminary estimation of the relative depth of the opponent's commitment to the statements one might use in one's refutation of that opponent's position. To do this, you have to go over the set of statements taking each pair at a time and asking "Is my opponent as deeply committed to this statement as he is to this one?" In some cases, you will be able to say 'yes' or 'no'; in other cases you may not know whether he is as deeply committed to the one as to the other or not. From your knowledge of your opponent's over-all position, you will however be able to compare the depth of his commitment with regard to many statements, more as the game progresses. Any proposition more closely

related to statements already belong to the opponent's commitment-store are likely to be more easily evaluated for depth of commitment. For example, if one's own thesis T_N is a direct consequence of a statement A, then my opponent is likely to be not at all deeply committed to A, or likely to accept A at all. But if a statement B is a direct consequence of another proposition C that the opponent is already committed to, then it is a good guess the opponent is likely to be committed to C as well. In other words, one constructs a strategy-set of statements by trying to evaluate the relative depth or tenacity of one's opponent's commitments to a set of statements selected as possible premisses in one's future moves. One tries to gauge the opponent's willingness to accept premisses. If, for various reasons, he seems as committed to B as he is to A, then we can judge that if queried, he will be at least as diffident in accepting A as in accepting B. Hence B might be a suitable premiss to prove A, but A would not be a suitable premiss to prove B. To construct a proof, one should presume that one's opponent is rational in his order of commitments in a limited way, but not too "rational".

What are some assumptions that might be appropriate to make about a strategy-set? First, it is useful to assume that your opponent is likely to be consistent in the relative depth of his commitments in the following three ways.

(1) Anti-Symmetry: If your opponent is as diffident with respect to A as to B, and he is also as diffident with respect to B as to A, then it is reasonable to assume that he is equally diffident with respect to both A and B.

(2) Reflexivity: It is reasonable to assume that your opponent is as diffident with respect to A as he is diffident with respect to A.

(3) Transivity: If your opponent is as diffident with respect to A as to B, and as diffident with respect to B as to C, then it is reasonable to assume that he is as diffident with respect to A as to C.

(4) Lower Bound: For any statement A in the strategy set, any statement B that implies (by direct consequence) your own thesis must be such that your opponent is as diffident with respect to it as A.

When we use the word 'reasonable' in the four assumptions above, we do not mean that they are "logical" assumptions so mush as good strategy. But they do reflect a certain degree of logical acumen attributed to your opponent. After all, if your opponent is so illogical that he is not operating within these assumptions, you shouldn't need a strategy to win the game--at least not a sophisticated one that presumes

your opponent will be diffident about accepting commitments that will immediately yield an inconsistency in his commitments, thus possibly causing him to lose the game.

The four assumptions above imply that a partial order with a lower bound may be defined on your strategy set. Let us call this partial order a strategy order. Now we must ask, how can you use this strategy order to refute your opponent?

To answer this, we must remember that you refute your opponent in a disputation by proving your thesis, which is the opposite of the opponent's thesis. To construct such a proof, you form a chain of statements, starting with premisses that your opponent is committed to, and moving towards the statement (your thesis) you want to prove. However, the nature of the problem of constructing such a proof is highly dependent upon the characteristics of the game of dialogue one has in mind.

Suppose, following the requirements of the Mackenzie game DC, that immediate consequence conditionals are closed under implication for commitment and no retraction of commitments generated under an immediate consequence conditional is allowed. If one's opponent is committed to A and $A \rightarrow B$ (where the arrow is immediate consequence) then that opponent must be committed to B and cannot retract B. One "proves" by starting with some initial premisses Π_0 that are

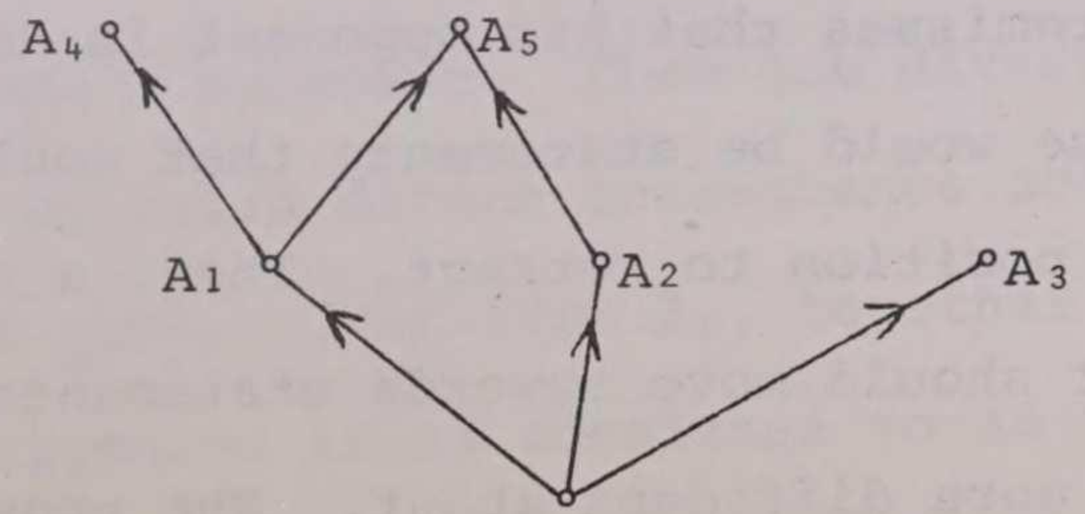
commitments of one's opponent. Then one directly generates a conclusion Π_1 by valid direct consequence according to the rules of the game. Then from Π_1, together with other premisses your opponent is as committed to as to Π_1, you generate another conclusion Π_2. And so forth to Π_n, the original thesis you are set to prove. Here there is no real need for a strategy order, except possibly within the premiss-sets themselves. Over the whole chain Π_0, Π_1, ..., Π_n, all that is required to force the opponent to accept Π_n is that he be committed in the first place to Π_0. The closure of each step allows him no way out. As long as your initial premisses are secure, you're all set to begin.[2]

But suppose, as in another possible game, individual steps in a chain of proof are closed under immediate consequence conditionals but retractions of commitments are allowed. That is, if I get you to agree to A and A → B, I can then by the appropriate deductive rule declare you committed to B. But suppose you can retract your commitment to B. You might reply, "Yes, well I liked A and A → B before, but since I can't accept B, I hereby retract my commitment to it, and retract A and A → B as well." Here the problem for the prover is more difficult. For the opponent can at any state break off your line of proof. How is the prover to proceed?

In this type of game, the prover needs a strategy of

starting with premisses that his opponent is deeply committed to. These would be statements that would be highly damaging to his position to retract. Then, a step at a time, the prover should move towards statements that his opponent may be more diffident about. The prover may need such statements to move towards the statement he is set to prove. If at some point the opponent retracts, the prover can go "back up the chain" until he reaches a point where the opponent fails to retract, and start again from there.

What the prover has to do in this game is to look over his strategy set and choose a path of proof that will reflect the strategy order of his opponent. There will be some statements A and B in the strategy order that will be <u>not comparable</u>, in the sense that the opponent is not clearly as diffident with respect to A as to B, but then it isn't clear that he is as diffident with respect to B as to A either. For example, A and B may be unrelated to statements in the opponent's commitment-store, and there may be no way to know how he might stand on them. For example, suppose part of my strategy order looks like the diagram below. Let the relation D (A_i, A_j) be read as: my opponent is as diffident with respect to A_i as to A_j. In general, this means that I strategically think or hypothesize that my opponent is as deeply committed to A_j as he is to A_i.



Here we have D (A_0, A_1), D (A_0, A_2), D (A_0, A_3), D (A_1, A_4), D (A_1, A_5) and D (A_2, A_5). But A_2 and A_3 are incomparable. We just don't know how to predict our opponent's reaction to being questioned on A_2 versus A_3. He might be more diffident about accepting one rather than the other. But then again he might not be.

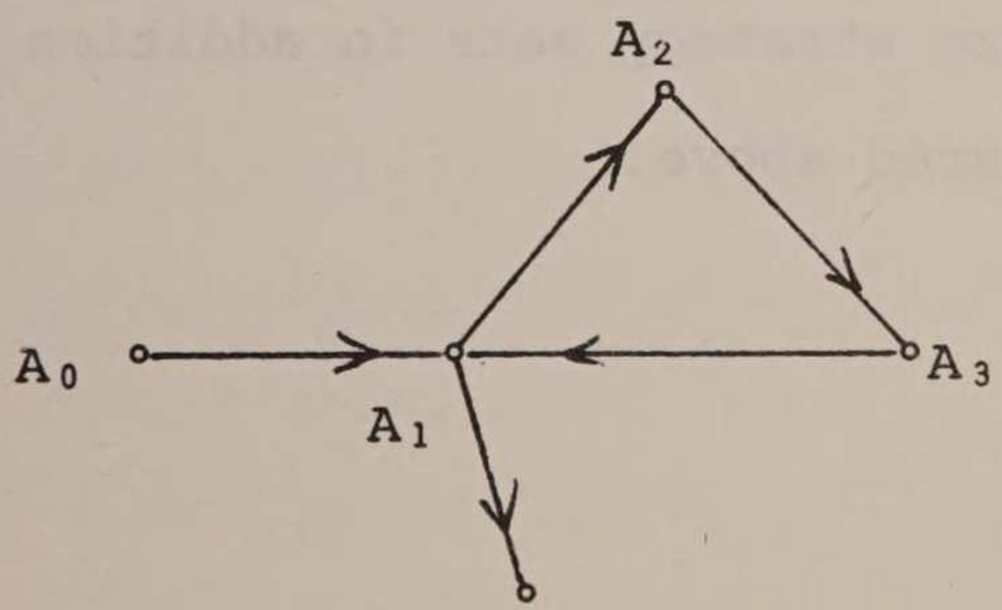
Now suppose we want to prove A_0 to this opponent. We know that he is as diffident about A_0 as he is about any statement in this part of our strategy. It would be good to select premisses from statements that he is at any rate not more diffident about accepting than A_0. Thus any of the remaining statements A_1 through A_5 would qualify as possibly suitable premisses. But if we chose A_2 as a premiss, then that only leaves us A_5 as a suitable remaining premiss for A_2. For A_5 is the only statement that we know the opponent is at least as deeply committed to as A_2, at least from the information yielded by this part of our strategy order.

We can see then that a strategy order helps to eliminate certain potential premisses as unsuitable, even though it

doesn't always tell us precisely which premiss to select, even once we have devised the order. It tells you not to select premisses your opponent is more diffident toward accepting, and to avoid premisses if you do not know whether your opponent is more diffident towards them or not.

One thing to notice about the strategy sets above is that circles are allowed. For example, notice that R (A_1, A_2), R (A_2, A_3) and R (A_3, A_1) could be a legitimate part of a strategy set for some proof. This is allowed because there is nothing to suggest it should be illegal. For example, suppose the thesis I have to prove is T_M and my initial proposition in a sequence of proof is A_0. Suppose I argue in a circle by this sort of proof:

$A_0 \rightarrow A_1$, $A_1 \rightarrow A_2$, $A_2 \rightarrow A_3$, $A_3 \rightarrow A_1$, $A_1 \rightarrow T_M$.



My proof for T_M has been redundant to be sure. Instead of looping through A_2 and A_3, I could have more directly argued:

$A_0 \rightarrow A_1$, $A_1 \rightarrow T_M$. In terms of the proof from A_0 to T_M, my opponent is no better off whether I use the longer (circular) or the shorter route.

In terms of strategy, my opponent may be better off if I choose the longer route, if I am competing against him to prove my thesis in the shorter number of moves. In this regard, circular reasoning may be in some instances bad strategy. In other instances, circular reasoning may be of strategic value by introducing a "spread" into one's proof. For sometimes a good strategy involves increasing the distance between two statements.

But these considerations bring us back to petitio principii and the other fallacies. It is time therefore to break off our development of logical games of dialogue as a pure theory and return to the practical context of the fallacies. This context will suggest that there are other useful ways to organize strategy sets in addition to the strategy order considered above.

Notes: Chapter Three

[1]Hintikka's second question-rule in 2.6 makes Hintikka games one particular form of this solution. However, Hintikka's ruling is a milder form of it. The solution discussed here forces the answerer to commit himself to A or ¬A if queried 'A?'. Hintikka's solution would force the answerer to commit himself to A, ¬A, or the negation of the presupposition of A. If the question has a harmless negated presupposition, the Hintikka solution can be fairly innocuous towards the answerer.

[2]One problem with this type of game is that requiring cumulativeness of immediate consequence conditionals while allowing retractions of other commitments may be too lax a policy. For the opponent threatened with a long chain of proof, who sees it moving towards a refutation at the next step or so, can still hastily retract the original commitment that started the proof, thus jeopardizing the whole proof. The problem would fail to arise in only the one instance where the original commitment also happened to be the opponent's thesis which, presumably, he cannot retract.

CHAPTER FOUR: FALLACIES REVISITED

Now we have the basic notions of the dialectical game fairly well in hand, the way to analysis of the fallacies of chapter one is well opened. The key to the ad hominem fallacy was to be found in the notion of a position of an arguer. An ad hominem attacker attempts to refute his opponent by finding an inconsistency in that position. These notions are, as we have seen, all nicely modelled in games of dialectic. A participant's set of commitments represents his position. The moves put forward by one participant in a strategy directed to determining an inconsistency in the other participant's commitment set represent the ad hominem attack. The rules of the game, containing as they do a logic element, determine whether the attack results in a successful refutation or not. As we saw, the proof of inconsistency of commitments is quite a serious blow in certain dialectical games. In some of them, it means loss of the game for the offender.

The fallacy of begging the question has so far proved curiously elusive as a fallacy, but our study of these games has thrown new light on circular argumentation. In this chapter, we must carry this work forward towards a deeper analysis of question-begging arguments.

The straw man fallacy can be resolved in games of

dialectic. According to the commitment rules, a statement may be attributed to one's position only if one has in fact accepted it in virtue of responding to the opponent's previous move, according to the appropriate commitment-rule. The fallacy arises in realistic debates and quarrels precisely because precise structural rules of logical dialogues are not adhered to. Thus CB and related games model the straw man fallacy in a useful way by making notions of position clear, and by providing guidance on the operation of commitment generation in dialogue.

We have made comments about fallacies of question-asking from time to time, but will return to this topic below. Fallacies of ad ignorantiam and ad verecundiam have to do with plausible reasoning in dialogues. We return to this topic as well, below. First however, let us take up arguments that have to do with irrelevance, including the emotional fallacies.

4.1 Relevance and Validity

Is classical propositional logic the best logic element for dialogues where disputes that may involve fallacies take place? This question is itself a disputed one and has to be approached with some caution. The main objection to classical logic as such a model conerns certain inferences that have a valid form in classical logic but

that may not intuitively seem to represent altogether correct arguments. The two most famous of these "paradoxical" inferences are these.

$\frac{\neg A}{A \supset B}$ Example: It is not raining. Therefore, if it is raining then 2 is a prime number.

$\frac{A}{B \supset A}$ Example: Auckland is in New Zealand. Therefore, if chlorine is heavier than air then Auckland is in New Zealand.

As the examples suggest, this sort of reasoning seems bizarre or astounding. But the forms of argument on the left are undoubtedly valid in classical logic. Consider the top one. The only way the conclusion ($A \supset B$) could be false is if A is true and B false. But if A is true, the premiss ($\neg A$) must be false. Hence there is no consistent assignment of truth-values that could make the premiss true and the conclusion false. Therefore, by the classical account of validity, any argument of that form must be deductively valid.

These arguments are certainly correct in a dialogue that adopts the classical point of view--they could never take a prover from true premisses to a false conclusion. But what is it about them that sometimes makes them seem

deleriously inappropriate as correct arguments?

Well, certainly one thing about them is that the basic propositions, the A and B, don't seem to have any connection with each other. What does the weather have to do with 2 being a prime number or not? What does Auckland have to do with the weight of chlorine? We were most concerned about fallacies of relevance in chapter one. If there are such things as fallacies of relevance, these argument forms must be the granddaddies of them all! Can an argument be valid yet fallacious? We seem caught in a conundrum.

However, perhaps at this point it is well to remember dialogue by the rules of classical logic does not really address itself to the notion of relevance. We purposely define $A \supset B$ in truth-functional logic in such a way that the conditional is an exclusive function of the truth-values of the basic propositions A and B--never mind whether A and B are related other than by their individual truth-values. Classical logic does its job of tracking inferences as long as it never allows us to go by valid argument from true premisses to a false conclusion--never mind the intermediate steps or interconnections of how we got there. Perhaps then, classical logic is not "wrong" as an account of correct argument, but is simply limited to one aspect of correctness of proof

argumentation. Relevance is yet another aspect.

One approach is that of Grice (1975) who argues that classical logic is correct but incomplete in that it requires supplementation by conversational trimmings in order to fully reflect the argumentation of natural conversational interchanges. According to Grice, we normally follow co-operative principles of conversation like the maxim, 'Be Relevant!' By the conversational approach then, the above two inference-forms are not incorrect but simply incomplete. In polite conversations, we avoid the rudeness of irrelevant transitions like 'If it's raining then 2 is a prime number'. But from a point of view of deductive logic, there's nothing wrong with such a conditional, the question of conversational relevance apart.

One problem with Grice's approach however is that relevance becomes merely a matter of conversational politeness rather than a matter of any precise logical regulation. Consequently, if there arises a dispute about whether two propositions in an argument are relevant to each other or not, it is not clear how it is to be settled. Grice offers no precise guidelines. So it seems we are down to the level of the unregulated quarrel and the subjective debate. If we can't agree whether A is relevant to B or not, and the dispute turns on the issue of relevance, how is it to be settled? Politeness may help, but may not resolve a

substantive dispute. It seems we are back to the psychological criterion of adversarial rhetoric. Whoever can persuade the opposition, the audience, or the referee to his side--that A is relevant or irrelevant--wins the argument. But is this approach good enough?

Much depends on how seriously we take the claim that failure of relevance really is fallacious. Is the irrelevant argument truly incorrect, or is it merely a lapse of manners or rhetorical persuasion?

One recent approach takes seriously the thesis that irrelevance is a logical failure. This approach, initially suggested in the Logic Seminar at Victoria University of Wellington in 1976 by David Lewis, postulates that an argument can be thought of as taking place relative to a set of topics. Let us call this set of topics, T, the most specific set of topics that represent what the argument is about. In many quarrels and debates, the set T is never clearly specified, but that does not mean that it couldn't be, or shouldn't be! If relevance is at issue, the set T should always be carefully specified in advance by the disputants. Then what we do is to assign to each basic proposition in the argument a subset of T called the subject-matters. The subject-matters represent the topical content of each basic proposition in the argument.

As a simple illustration, supposing the set T in an

argument is {bananas, yellow, nutritious, edible}. And suppose we encounter two propositions: A is the proposition 'Bananas are yellow' and B is the proposition 'Bananas are nutritious'. Then the subject-matter of A is the set {bananas, yellow} and the subject-matter of B is the set {bananas, nutritious}. In other words, each proposition in the argument will take on not only a set of truth-values, as in classical logic, but also a set of subject-matters. Then it is natural to rule that A is relevant to B in one important sense (or better, A is related to B) if A shares subject-matter overlap with B. In the present example, we say that 'Bananas are yellow' is related to 'Bananas are nutritious' because each proposition shares the common topic 'bananas'. However, in the two "paradoxical" argument forms above, it is easy to see a failure of relatedness. For example. 'It is raining' does not share any common subject-matters with '2 is a prime number'.

Relatedness of propositions in argument could refer to many different types of relationships. Clearly however, one fundamental type of relatedness is subject-matter overlap of propositions. As a general notion, subject-matter relatedness has three defining properties. First, it is a reflexive relation--that is, a proposition is always related to itself. For example, 'Bananas are yellow'

shares subject-matters with itself. Second, it is a symmetrical relation--that is, if A is related to B then B must be related to A. For example, if 'Bananas are yellow' shares subject-matter with 'Bananas are nutritious' then the second proposition must also share a subject-matter with the first. One could scarcely doubt that subject-matter relatedness has these two properties.

But when we come to a third property, that of transitivity, we see it fails. It may be the case that A is related to B, and B is related to C, yet it may not be true that A is related to C. For example 'Bananas are yellow' is related to 'Bob ate six bananas' and 'Bob ate six bananas' is related to 'Bob has six children'. However 'Bananas are yellow' does not share any subect-matters with 'Bob has six children'. Thus subject-matter relatedness is not transitive, as a general characteristic.

Now we have at least one clear basic idea of what relevance in arguments could mean, how does such a conception affect the correctness or incorrectness of arguments? Following a formalization of Epstein (1979) we can construct a relatedness propositional calculus that will be just as formal a logic as classical logic. Here is how it is done.

First we have to define new constants, in line with our new model of argument. The most trouble we had in

classical logic was with the conditional. The problem seemed to be that completely unrelated propositions could make up true conditions just because of their individual truth-values. This problem suggests that in order for a relatedness conditional to be true, the basic component propositions should be related by common subject-matters. The following type of definition is thereby suggested.

Let $\mathcal{R}(A,B)$ stand for 'A is related to B'.

A	B	$\mathcal{R}(A,B)$	$A \rightarrow B$
T	T	T	T
T	F	T	F
F	T	T	T
F	F	T	T
T	T	F	F
T	F	F	F
F	T	F	F
F	F	F	F

Relatedness Conditional: $A \rightarrow B$ is false only if (1) it is not the case that A is true and B is false or (2) A is not related to B.

By the above definition, $A \rightarrow B$ requires both that the truth-values are right (like the material conditional) and also that A is related to B.

Now how do we define the other connectives? First consider negation. Here relatedness does not seem to matter. If A is related to B, then $\neg A$ will also be related

to B. If A is not related to B, then ¬A will not be related to B either. For example, if 'Bananas are yellow' is related to 'Bob ate a banana', then 'Bananas are yellow' will also be related to 'Bob did not eat a banana'. Hence negation can be defined the same way as in classical logic--we need not worry about the factor of relatedness at all.

Similarly, with conjunction relatedness does not seem to be important. If we conjoin together two propositions 'Bananas are yellow' and 'Bob has six children' then that conjunction is true if both of the component propositions are true, never mind that one is not related to the other. Hence we can define conjunction using the same truth-table as in classical logic.

Disjunction, however, appears to require relatedness. That is, the proposition 'Bananas are yellow or 2 is a prime number' does not seem to be true because the two component propositions are unrelated. Therefore we define the relatedness 'or' as follows: 'A ∨ B' is true just in case (1) at least one of the pair {A,B} is true and (2) A is related to B.

Now we have given truth-tables for all the constants of relatedness logic, we seem to have all we need for a logic. But there is still one question to be resolved. In classical logic all the constants were

truth-functional. But these new ones, at least the → and ∨, are not. Thus we have to make a decision on how the basic propositions are related to the complex ones. When is a simple proposition A related to a conditional, B → C? Does A have to be related to both B and C, or is it enough that it be related to just one of them? For example, is 'Bananas are yellow' related to 'If Bob is a canary then Bob is yellow'? Well, it does seem to be. That is, 'Bananas are yellow' is related to part of the conditional 'If Bob is a canary then Bob is yellow' (namely the consequent), so it seems that we want to say it must therefore share some subject-matter with the whole conditional. If so, the rule we need to adopt is this one: A is related to B → C just in case A is related to B or A is related to C.

We adopt similar rules for ∧ and ∨: A is related to B ∧ C (B ∨ C) just in case A is related to B or B is related to C. Thus the general approach is this: one complex proposition is related to another complex proposition if any one component proposition of one complex is related to any one component of the other complex. For example, if we have two complex propositions '(A → B) ∨ (C ∧ ¬D)' and '(E ∨ F) → ¬G' then we know that they have to be related if any of their parts are related. Suppose for example that B is related to G. Then we immediately

know that the two complex propositions are related to each other.

Just as in classical logic, there is always a finite decision procedure for determining correctness or incorrectness of arguments in relatedness logic. Consider <u>modus ponens</u> in relatedness logic.

	A	B	$\mathcal{R}$(A,B)	A → B
(1)	T	T	T	T
(2)	T	F	T	F
(3)	F	T	T	T
(4)	F	F	T	T
(5)	T	T	F	F
(6)	T	F	F	F
(7)	F	T	F	F
(8)	F	F	F	F

A → B
A
———
B

<u>Modus Ponens</u>

As you scan over the eight rows of the truth-table, you can see that there is no row where both premisses (A → B and A) are true and where the conclusion (B) is false. Hence <u>modus ponens</u> is valid in relatedness PC.

Also, just as in classical PC, we can see that affirming the consequent is invalid in relatedness PC. In row (3), A → B is true and B is true, but A is false.

Hence we see that the conception of validity is the

same in relatedness logic as in classical logic. A valid argument is one that never goes from true premisses to a false conclusion. But the difference is that in relatedness logic, subject-matter relevance is explicitly taken into account in the way we define the constants of the logic.

We should also note that relatedness PC will turn out to be a subsystem of classical logic. All arguments valid in relatedness logic will also be valid in classical logic. But there are some forms of argument that are valid in classical logic but that fail to be valid in relatedness logic. Some examples may be instructive.

$$\frac{A \to B \qquad B \to C}{A \to C}$$

Transitivity of the Relatedness Conditional

Could the premisses of this form of argument be true while the conclusion is false? Well, we have already seen that consideration of truth-values alone would not permit an assignment that would make the premisses true and the conclusion false. But as formulated above, the form of argument with → instead of ⊃ requires the right arrangement of subject-matter relationships as well. What if the subject-matter of A fails to be related to that of C.

Still, it is quite possible that A is related to B, and B is related to C. If the truth values were right in such a case, then both premisses would be true and the conclusion false. Thus there is at least one row of the truth-table where both premisses are true and the conclusion is false. One of them is as below.

A	B	C	$\mathcal{R}$(A,B)	$\mathcal{R}$(B,C)	$\mathcal{R}$(A,C)
T	T	T	T	T	F

This possible assignment of truth values makes the premisses true and the conclusion false. Hence the form of argument above for transitivity of the relatedness conditional is invalid.

Another valid argument form of classical logic that fails to be valid in relatedness logic is exportation.

$$\frac{(A \wedge B) \rightarrow C}{A \rightarrow (B \rightarrow C)} \qquad \frac{(A \wedge B) \supset C}{A \supset (B \supset C)}$$

Looking on the right, we see that exportation as a form of argument is valid in classical logic. The only way the conclusion could be false is if A and B are both true and C is false. But given these values, the premiss must be false as well. The premiss cannot be true while the

conclusion is false. Hence exportation is valid in classical logic.

But what about validity in relatedness logic? Look at the form on the left. Consider these values.

A	B	C	$\mathcal{R}$(A,B)	$\mathcal{R}$(B,C)	$\mathcal{R}$(A,C)
T	T	T	T	F	T

If B is not related to C (as above), then the part B → C of the conclusion must be false. But if A is true (as above), then the whole conclusion A → (B → C) must be false by virtue of the truth-values. However it is still possible for the premiss to be true, even given these values. If A, B, and C are all true, then (A ∧ B) → C will be true provided one or the other of A or B is related to C. To make the conclusion false, we made B not related to C. But we could still consistently assume that A is related to C (as above). Such an assignment (as above) makes the premiss true and the conclusion false. Hence this form of argument is not valid in relatedness logic.

These examples show that relatedness logic is every bit as much of a precise decision procedure to determine validity or invalidity of arguments as classical logic. However, the class of valid arguments turns out to be

different. Reason: in relatedness logic, relevance of subject-matters is taken into account. We conclude that either classical logic or relatedness logic is a correct account of 'proof'--which account of 'proof' is appropriate to a given context of argumentation depends on the nature and objectives of the game of dialogue one has in mind.

We now have a clear basic definition of "relevance" and clear guidelines to determine validity or invalidity in propositional logic where relevance can be taken into account. Moreover, we seem to have solved the real problem about the "paradoxical" inferences like '¬A, therefore A ⊃ B' and 'A, therefore B ⊃ A' in classical logic. For their counterparts in relatedness logic ' A, therefore A → B' and 'A, therefore B → A' are not universally valid. The examples of these inferences, like 'It is not raining, therefore if it is raining then 2 is a prime number' are invalid in relatedness logic. Reason: 'It is raining' fails to share overlapping subject-matters with '2 is a prime number'. Have we now solved all our problems about relevance?

We will see that we have not, and that there are other kinds of "relevance" as well as subject-matter overlap that play important roles in the study of fallacies.

4.2 Relevance in Dialogues

In section 3.5, we proved two theorems that established a near-equivalence between the strategies of proving your own thesis and proving a direct inconsistency exists in your opponent's position. This near-equivalence means that, in games of disputation studied so far, ad hominem arguments are nearly equivalent to simply proving one's own thesis in the game, according to the rules. However, if we now adopt relatedness propositional calculus as the logic element for a game of dialectic, this near-equivalency fails.

The proposal is this: let us take CB and replace classical logic everywhere by relatedness logic, otherwise keeping all rules the same. Let's call the new game of dialogue thereby constructed CBR. Instead of $\supset$ as a connective, CBR will have $\rightarrow$. Moreover, all rules of CBR will be rules valid in relatedness logic. This means that there will be some rules, e.g. the rule of addition, that will be barred as rules of CBR. We recall that in general, $A \rightarrow (A \vee B)$ may fail in relatedness logic, because A may not be related to B in subject-matter. Clearly then, theorem 1 of 3.5 fails in CBR.

Does this requirement eliminate all fallacies of irrelevance from CBR? The answer is "No, it does not altogether." It does eliminate tautologies like $A \rightarrow (B \rightarrow A)$, and it does

assure a kind of relevance of A and B in propositional inferences. But it does not mean that just because A is related to B, and A is not true while B is false, that the inference from A to B is free of all fallacies that might be called "fallacies of relevance". For example, $[A \vee (B \vee \neg B)] \rightarrow (B \rightarrow A)$ is a tautology in relatedness logic. By adding $B \vee \neg B$ to the antecedent, it seems that we can adventitiously make it "relevant" to the consequent. It seems then that there may be other senses of "relevant" appropriate to argument.

One type of irrelevance is failure of subject-matter overlap of statements as modelled by CBR. A second type of criticism of irrelevance occurs where there are perceived to be premisses in an argument that are not used or needed to prove the conclusion. We have seen that an optimum strategy in games of dialogue is one that avoids this second kind of relevance. The extracting of commitments from an opponent that are then not needed as premisses for one's proof-strategy has been characterized as defective strategy.

Notice here however that defective strategy need not be fallacious. As we have remarked before, bad strategy is more like a failure to protect one's own interests or objectives in a game of dialogue than it is an incorrect type of argument used against your opponent, or a sophistical

ploy of refutation that your opponent should be on guard against. Certainly this type of failure of relevance may be a bad strategy of one sort, but it need not follow that in disputation, it is a failure that should be called a fallacy. Perhaps however, it could be thought of as a "fallacy" at least insofar as it represents a type of strategy that is not efficient in making for good play in disputation.

A third type of failure of "relevance" occurs where a player simply has too little in the way of premisses. It's not that his premisses are subject-matter unrelated or useless to prove his conclusion by the rules of the game. Rather, it's just that he doesn't have enough commitments to function as premisses. This type of failing in strategy is often what seems to be in mind when criticisms of the ad baculum, ad misericordiam, or ad populum sort are made. Instead of having any premisses at all--so goes the criticism we studied in 1.6--the attacker simply mounts an emotional barrage to mask his lack of statements to function as premisses. Here then is a third type of criticism of irrelevance.

A fourth type of irrelevance has to do with the answering of questions. Often when an answerer ventures some statement by way of reply but fails to produce a direct answer to a question, his response may be criticized

as "irrelevant". Since this type of fallacy has to do with question-asking, we return to it for separate consideration below.

A fifth type of criticism of irrelevance is called in Walton (1983a) conclusional irrelevance. This failure occurs where an arguer produces a valid argument for the "wrong" conclusion. In fact this is just the type of fallacy we studied in 1.4 as irrelevant conclusion. In games of dialogue like CB or CBR, this fallacy really amounts to failure to execute good strategy, i.e. to prove your own thesis in the dispute. Once again therefore, the question is raised whether such a failure in a logical game of dialogue is a misdemeanor or merely a strategic lapse against one's own strategic objectives.

Perelman and Olbrechts-Tyteca (1969, p. 485) describe one kind of diversionary tactic in argument as "turning the discussion onto secondary points which can easily be defended with success". This tactic would appear to correspond to what we have called 'irrelevant conclusion'. While it is undeniably true that such evasive tactics are a common feature of many ordinary quarrels and debates, in games like CB and CBR with nicely defined strategic and structural rules binding each move of the participants, they are simply futile and self-defeating. This is so because we have followed Hintikka's procedure of setting a

thesis as the objective of proof for each participant at the outset of the game. Hence the games we have advanced do not allow successful strategies of this evasive type.

We could however design a game that would allow more mobility in conclusion selection by the participants as they play. We could do this by allowing each player to retract his conclusion at various points in the game. Such a game would then, in effect, be conclusionally non-cumulative. In such a game, a player could ask another to retract the latter's thesis-to-be-proven and select another one instead. We shall not pursue the class of games further however, because conclusional retraction would introduce a new class of complexities. As things stand, we haven't even dealt adequately yet with all problems posed by allowing retractions of commitments in games of dialogue. Indeed, one might say that we have had such good luck with the games of dialogue studied so far precisely because the conclusion of each player is firmly fixed at the outset of play.

4.3 Questions

We have already seen in designing strategies for games of dialogue that the main problem boils down to whether 'No commitment' should be allowable as a legal response when one's opponent asks a question. Indeed, the

famous spouse-beating question of 1.5 has its main sting removed if the answerer is allowed to reply 'No commitment' instead of having to say 'Yes' or 'No'. In CB however, it can be a benefit to a player to make commitments. So there still could be an occasional problem posed where an answerer confronts a question like the spouse-beating question. Whether in that event we should still want to call the question a "fallacy" seems open to contention.

A whether-question poses a number of alternatives, of which the answerer is supposed to select one. For example: Is she wearing the red dress or the green dress? Each of the alternatives is called a direct answer. Any statement implied by every direct answer is called a presupposition of the whether-question. Take the whether-question 'Is she wearing the red dress and the purple hat, or is she wearing the green dress and the puce shoes?' In effect, the question poses an alternation of two conjunctions, i.e., it says: $(R \wedge H) \vee (G \wedge S)$? Thus the direct answers are '$R \wedge H$' and '$G \wedge S$'. An example of a presupposition would be 'She is wearing a dress', because it is implied by both direct answers.

Belnap (1963, p. 127) proposes that every question presupposes that at least one of its direct answers is true. Then he rules that the proposition that at least one of its direct answers is true is called the presupposition of the

question. A question is called <u>safe</u> if its presupposition is locally necessary, <u>risky</u> if it is not safe. For example, 'Is she wearing the red dress or not?' is safe because its presupposition is 'R ∨ ¬R' is logically necessary. <u>Yes-no questions</u> are always safe because their presupposition consists in a pair of contradictory alternatives, e.g., the presupposition of 'Is snow white?' is 'Snow is white or snow is not white'.

Let us see how the fallacy of many questions can be studied in relation to the spouse-beating question (1): Have you stopped beating your spouse? Following Åqvist, let W = You have a spouse and have beaten him, and S = You have stopped beating him. Then the question says: (W ∧ S) (W ∧ ¬S)? But this is truth-functionally equivalent to the ordinary statement W. So (1) is risky. If the presupposition W is in fact false, it is impossible to give a true direct answer to (1) since W appears on both sides of the disjunction, (W ∧ S) ∨ (W ∧ ¬S). Thus the only sensible answer is to "correct" the question, perhaps by pointing out the falsity of W. So the fallacy arises where a question that is actually risky and moreover has a false presupposition is put in the guise of a safe "yes-no" question, according to Belnap (1963, p. 128) and Åqvist (1965, p. 66). Syntactically, the question is safe, but semantically it is risky--a contradiction.

Hintikka (1976, p. 28) treats (1) somewhat differently from Åqvist or Belnap. He notes that (1) has as presupposition the statement, '(∃x) (you stopped beating your wife at x)' which in turn implies that before x you were beating your wife. He describes such a question therefore as "notoriously loaded".

It is useful to remember however that not all questions that have substantive presuppositions are fallacious. 'Is she wearing the red dress or the purple hat?' need not be fallacious if its presupposition is not concealed. So Hintikka's account does not by itself explain what is precisely fallacious about (1). Moreover, not all risky questions are fallacious that (a) have a <u>false</u> presupposition, and (b) are in the form of a "yes-no" question (or perhaps other form of question that appears safe). 'Are you the student who sat at the back and asked a question yesterday?' may be unfallacious, even if the "student" was really a disguised teaching evaluator. Certainly this question is not fallacious in the same way that our initial sketch of (1) suggested an unfair manoeuvre of overly aggressive and deceptive question. It seems therefore that neither the Hintikka or the Belnap-Åqvist explanations are entirely satisfactory.

What is objectionable about (1) is not so much that its presupposition is false. Rather, it is an objectionable

question only if posed to an answerer who does not want to admit to spouse-beating. If an answerer is fully prepared to freely concede his spouse-beating activities, answering the question may not be a problem for him at all. Hence the fallaciousness of (1) seems best captured in relation to the commitments of an answerer in a game of dialogue.

If we adopted as a rule of dialogue that a question may only be asked if its presupposition is a commitment of the answerer, then problematic questions like (1) could never legally be asked in dialogue. This solution to the problem appears too strong however, for it would make it very difficult for the questioner to ask non-innocuous questions unless he already has a large and varied body of his opponent's commitments to work with.

Of course the alternative solution is to allow the answerer the 'No commitment' option in his answers to yes-no questions, enabling him to easily avoid the trap posed by (1). But this too would make the game very difficult for the questioner in his development of strategies. However, we have already seen in CB that objectives can be devised in games that will make it a benefit to the answerer to incur commitments. If the incentive to incur commitments is strong enough, then this alternative solution could become workable.

In addition to giving points for commitments, as we did in CB, there are other useful ways to encourage an answerer to adopt strategies where he makes commitments. One of these ways at least encourages a player to stick to his commitments once he has made them, rather than retracting them.

Previously we have distinguished two kinds of inconsistency that can affect a player's commitments. According to the first kind, a player may be committed to S but also committed to ~S. According to the second kind, a player may be committed to S, but may then later reply 'No commitment S'. Of course, in the latter event, his commitment to S would be removed by the rules of CB, and consistency would be maintained in his commitment-set. Yet even though this second kind of inconsistency, which we will henceforth call ambivalence, is not really an inconsistency in the statements in one's commitment-store, it may still represent a kind of insincerity or irregularity in playing the game. We might become annoyed with a player who keeps making an assertion and then retracting it whenever he feels it may become a liability to maintain it.

To regulate inconsistency of commitment, we could add the following rule to CB.

(+) A player loses all the points he has previously accumulated for incurring commitments if (i) he has previously indicated 'No commitment S' for some statement S, but S is shown by his opponent to be an immediate consequence of some of his commitments, or if (ii) he is committed to some statement S but then moves 'No commitment T' where T is an immediate consequent of S.

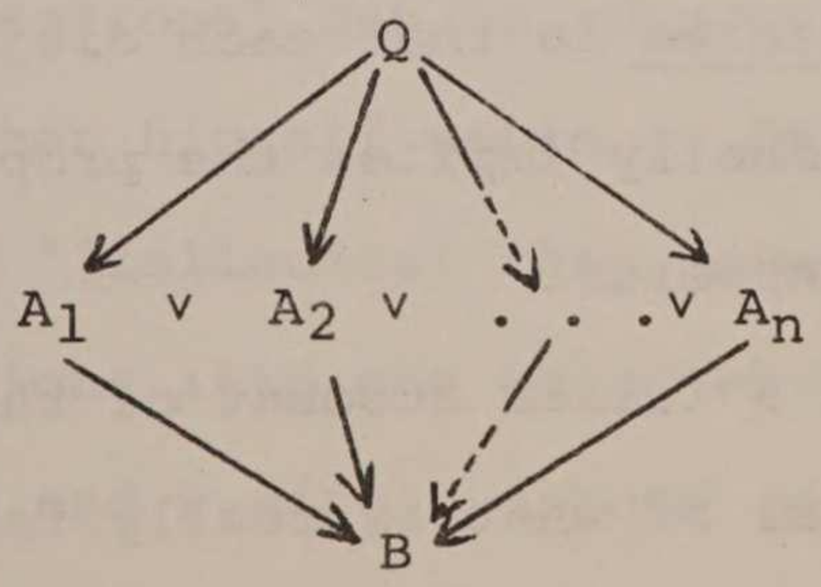
Let us call what results from adding (+) to CB the game CB(+). In CB(+) retractions of previous commitments or changes to commitment from a previous move of 'No commitment' are allowed. Hence CB(+) is not a cumulative game. But such changes will tend to be minimized by dictates of good strategy.

In CB(+) there is enough strategic incentive for a player to make commitments so that to allow him the 'No commitment' option need not make the game too heavily weighted in his favor. Such a player then will be led to make commitments in some instances even if he does not need to do so as part of his proof-strategy. However, he need not be forced into the position of accepting commitments that would too easily lead to his undoing. Let us call a statement that a player should not accept as a commitment on strategic grounds a <u>strategically unwelcome statement</u>.

A player's defensive strategy is to avoid unwelcome commitments yet to accept commitments he thinks are not strategically unwelcome, insofar as he thinks he might need them.

At any rate, by making the 'No commitment' response to (1) a feasible part of one's game of dialogue, one aspect of the fallaciousness of (1) can be contended with. For whatever is fallacious about (1), certainly one aspect of (1) stands out. (1) <u>forces</u> the intended victim to accept the unwelcome presupposition no matter which way he answers <u>yes</u> or <u>no</u>. Like the well-known frustrating questions of objective tests, it requires but does not contain an alternative 'None of the above'. There is more to the fallacy than its being really loaded while demurely offering the appearance of safety. Not only is it loaded, but <u>all</u> the chambers are loaded.

A safe question may be described as one that has alternatives that are logically exhaustive of all the possibilities. To answer it you must choose one.



But no matter which one you choose, you may also be forced to choose some unwelcome proposition B, individually implied by each of the A_i. The deeper explanation of the essential fallaciousness is that Q appears safe because the A_i are logically exhaustive and consequently $A_1 \vee A_2 \vee \ldots \vee A_n$ is a tautology. Up to this point, Q is indeed "safe". But the deeper level of analysis represented by the third stage of the diagram reveals that the A_i themselves collectively contain a presupposition that is not a tautology. Each and every one of the A_i implies B. And B, as might happen, may be not only <u>not</u> a tautology, it may be unwelcome.

So it is a matter of peeling off two levels of analysis. At the first level the presupposition is safe, but at the second level it is loaded. And the twist is that we can't remain at the first level, for B is a deductive consequence of <u>every</u> A_i at the first level. Thus there is a third factor. Not only first, does the question appear to be safe while in reality it is risky, but second it is more than risky, it is loaded. But third, the fallacy is <u>coercive</u> in that each disjunct of its presupposition individually implies the proposition that is unwelcome to the answerer.

We now have a fuller account of the fallacy. It explains a good deal of what is really fallacious about

the spouse-beating question. However this fallacy, while plainly a significant and practically interesting one, is not the only fallacy that might be called, or that has been called "many questions" ("complex question", etc.)

In concluding his discussion, Åqvist makes an interesting point about the label 'Fallacy of Many Questions': ". . . the label does not appear particularly appropriate in view of the fact that it misleadingly suggests that what is wrong about questions involving false presuppositions consists in their involving two or more independent questions" (Åqvist, 1965, p. 75). Consequently, using the label 'Fallacy of Many Questions' might lead us to overlook the distinction between fallacious and merely multiple questions. Belnap and Steel make a kindred point in remarking that the fallacy of many questions is badly named. Hence something like "Fallacy of False-Presupposition Questions" might be more to the point, in Åqvist's or Belnap's terms. In the context of the foregoing analysis, perhaps it might graphically be called "The Fallacy of Force-Loaded Questions". Certainly, "many questions" can be ruinously misleading.

The philosopher himself wrote at De Sophisticis Elenchis 167 b 39: "[fallacies] that depend upon the making of two questions into one occur whenever the plurality is undetected and a single answer is returned as if

to a single question." This difficulty is a different sort of problem than the one we have been mainly attempting to confront in (1), yet clearly it is one ingredient that helps to explain an important aspect of how the fallaciousness of (1) works. The way to deal with this particular difficulty is simply to separate the questions, as Aristotle himself observes at De Sophisticis Elenchis 181 b 1: "To meet those refutations which make several questions into one, one should draw a distinction between them straight away at the start. For a question must be single to which there is a single answer, so that one must not affirm or deny several things of one thing, nor one thing of many but one of one." Indeed, it seemed that a major problem suggested by the examples of 1.6 was to divide up the truth-functional combinations of permissible answers to questions so that the answerer is not forced to choose only among unwelcome combinations. One way to solve this problem is to allow a questioner only to ask truth-functionally simple questions (one at a time). Another solution is to allow the answerer to select from all possible combinations of answers instead of allowing the questioner to restrict him to the few she selects.

However once strategic considerations enter into the constructions of possible games of dialogue, we can see that, in effect, both of these options tilt the balance

of power greatly towards the answerer, thereby making fewer win-strategies open to the questioner. Yet in any event, as long as the 'No commitment' option is open to the answerer (to select none of the offered alternatives if he wishes), it is acceptable to design the game to allow the questioner complex questions. Then the questioner may adopt a strategy of asking questions like (1) that appear safe but are really loaded. And it is up to the answerer to adopt a strategy of avoiding a 'yes' or 'no' answer if one or more of the presuppositions of the question is unwelcome. In this type of game, questions of the form of (1) are not illegal moves, but do represent a form of strategy that a player must learn to contend with.

Here then is perhaps another sense of the term "fallacy". The many questions or spouse-beating fallacy is a strategic device that a questioner in CB(+) may try to deploy. However, the strategically sound defence against this ploy is to always answer 'No commitment' if any part of the presupposition of the question is unwelcome.

4.4 Plausibility and Conflict of Authorities

Let us now return to two themes that have been central to several of the fallacies--plausibility and

inconsistency. Adding the notion of plausible inference to games of dialogue promises several interesting avenues of development, since the theory of Rescher (1976) is especially designed to help us carry on an orderly process of reasoning in the face of inconsistent data. Plausibility of a proposition is a weaker notion than either truth or probability, and it has to do with the burden of proof of the proposition in an argument. If I do not know in fact whether or not A is true, or even probably true, yet I have to act on A, I may decide that there is a certain burden of presumption in favor of or against A. One way of judging this might be if A is put forward in the argument by someone else's testimony or conjecture, and I have no reason to question or reject A. Another way would be where A is put forward by some expert witness or source. Now to say that A is plausible does not mean that A should be fully accepted as true, or as a commitment. Rather, A should be provisionally accepted, perhaps as a part of one's strategy, unless some reason for rejecting it comes along. The key idea of plausible inference is that a conclusion cannot be less plausible than the least plausible premiss of a deductively valid argument (least plausible premiss rule).

One particularly useful technique of plausibility analysis is <u>plausibility screening</u>, a method for proceeding when we are confronted by a group of experts whose

pronouncements conflict.

Suppose we have a group of four experts E_1, E_2, E_3, and E_4, who are consulted on some questions in their area of expertise. The consultations concern three statements, A, B, and C, that we are trying to deliberate upon in order to arrive at some decision concerning them. Let's say that some of these experts are more experienced and qualified than others, and on a scale of 1 to 10 we are able to comparatively rate the credibility of each expert as follows: $E_1(5)$, $E_2(8)$, $E_3(2)$, $E_4(8)$. Concerning the propositions put to them, the experts each advance the following advice as to their truth.

Proposition	Expert	Plausibility Value
$A \vee B$	E_1	5
$A \supset C$	E_2	8
$B \supset C$	E_3	2
$\neg C$	E_4	8

To conduct a plausibility screening analysis, we first of all look to see whether the set of propositions above is collectively consistent or not. If not, we want to determine all the maximally consistent subsets, and then choose amongst them. To determine these things, we construct a truth table.

	A	B	C	A ∨ B	A ⊃ C	B ⊃ C	¬C	Maximally Consistent Subsets
(1)	T	T	T	T	T	T	F	A ∨ B, A ⊃ C, B ⊃ C
(2)	T	T	F	T	F	F	T	
(3)	T	F	T	T	T	T	F	
(4)	T	F	F	T	F	T	T	A ∨ B, B ⊃ C, ¬C
(5)	F	T	T	T	T	T	F	
(6)	F	T	F	T	T	F	T	A ∨ B, A ⊃ C, ¬C
(7)	F	F	T	F	T	T	F	
(8)	F	F	F	F	T	T	T	A ⊃ C, B ⊃ C, ¬C

From the truth table, we can see that the set of propositions {A ∨ B, A ⊃ C, B ⊃ C, ¬C} is collectively inconsistent. For as we scan along the rows (1) to (8), there is no single row where each of these four propositions is true. Since they cannot be jointly true in any of the possible cases, they must be collectively inconsistent.

Next, we determine the maximally consistent subsets by picking out the true propositions in each row, and circling the ones not included in any others. For example, row (2) is already included in row (6). Rows (3) and (5) are the same as row (1). And row (7) is included in row (8). This leaves the four maximally consistent sets listed above, each taken from its respective row.

How should we select from these four maximally consistent

subsets? The method adopted by Rescher (1976) is to try to maximize the plausibility of the information you accept. This means rejecting the sets that exclude high-plausibility propositions. Each of the four maximally consistent subsets above excludes one proposition as follows. (1) excludes ¬C (value 8), (4) excludes A ⊃ C (value 8), (6) excludes B ⊃ C (value 2), and (8) excludes A ∨ B (value 5). Clearly (6) excludes the least plausible proposition, and therefore is the best choice of the lot. Consequently, the screening procedure suggests accepting (6), the set of propositions {A ∨ B, A ⊃ C, ¬C}.

As Rescher notes, such screening may result in ties, different maximally inconsistent subsets that reject the same plausibility values or comparable ones. In this case, he recommends looking for "common denominators" or common subsets of the maximally consistent subsets that one would have to accept no matter which way you choose. At any rate, we can now clearly see how the method of plausibility screening allows us to rationally proceed when confronted by a body of experts whose pronouncements are collectively inconsistent, and where the inconsistency cannot be resolved by other means.

4.5 Case Study: Legal Testimony by Experts

One well-known arena where conflicts in expert testimony must be fought out in disputation is the criminal trial. Ballistics experts and other forensic specialists are often called upon to give evidence. One of the most famous kinds of "battle of the experts" occurs where psychiatric specialists are called upon to determine whether a defendant knew the nature and quality of his act, in order to resolve a plea of insanity. It is a notorious problem, not only that the experts disagree, but that juries have a very difficult time following their arguments.

In the famous case of Regina v. Roberts (see Canadian Criminal Cases 34 (1977), 177-183 for the appeal), a man was convicted of the murder of a woman who lived in the same apartment building. The basis of the conviction was expert testimony that loose human hair found on the body, bed and nightshirt of the deceased were similar to those of the accused. In his appeal, the convicted and incarcerated man, through the assistance of a concerned attorney who had taken up his case, sought to introduce the evidence of two other experts who used different methods of hair analysis. Eventually the appeal led to a new trial and the man's acquittal.

At the original trial, no expert evidence had been

brought forward to dispute the reliability of the expert testimony that led to conviction. During the re-trial, the evidence of the two other experts indicated expert witness had been based on outdated techniques, and that the accuracy of these techniques had been overestimated.

The accused had spent several years in prison before he was ultimately released through the re-trial. Upon release he stated that he had merely gone to the assistance of the murdered woman, not realizing what a potentially compromising situation he had put himself in by trying to be of assistance. Thus the case is an interesting study in the perils of adjudicating arguments based on expert testimony.

The first expert, Mr. Dieter Von Gemmingen, an analyst from the Centre of Forensic Sciences, testified that he had "assisted in over five hundred investigations involving hair analysis" (34 C.C.C. (1977, p. 178)). Mr. Von Gemmingen claimed that by looking at certain patterns in the hair, pigmentation granules and other spots, and the shape and thickness of hair, he could say that hairs were similar to one another. However, he admitted that he could not say with certainty that a hair belonged to a particular person. He found that numerous hairs found in the area of the victim were similar to those of the defendant, and the judge made it clear that this finding

was important and significant evidence in the trial that resulted in conviction.

The first expert cited in the appeal, Dr. H. Klingele was a professor of pharmacology and organic chemistry and had a doctorate in organic chemistry.[3] He stated that hair analysis falls within his field of biochemistry. Dr. Klingele also found the hairs of the accused similar to those found at the scene of the murder, however he claimed that there is a large margin of error in comparative microscopic analysis of blonde and light hairs like those of the accused man's. He even claimed that there are no pigmentation granules in blonde hair, in direct conflict with Von Gemmingen who spoke of similarity of pigmentation granules in his evidence. Klingele also stated that neutron activation analysis was in his opinion a much more reliable test than the visual microscopic examination used by Von Gemmingen.

The second expert, Dr. Robert E. Jervis, a professor of nuclear physics and radiochemistry and a Ph.D. in physical chemistry was also director of a nuclear reactor facility and had done research in the field of radiochemical and radioactive techniques for twenty-six years. Dr. Jervis originally developed the technique of neutron activation analysis now widely used internationally by forensic scientists to analyze twenty to thirty-

five factors in hair to determine the source of the hair.[4] This technique uses irradiation and subsequent measurement of isotopes of the elements found in the hair. These measurements are then used to run computer tests for the amounts of trace elements in the hair. Dr. Jervis ran these tests on the hair samples filed at the trial and concluded that it was very unlikely that these samples came from the head of the accused man. Upon cross-examination, Dr. Jervis explained that he meant by "very unlikely" not that something was impossible but that in "my subjective opinion that . . . very unlikely is, to all intents and purposes in this case, impossible." (p. 181).

It seems then that the main evidence at issue in the case was the expert testimony on the hair analysis, and that the two experts, using different techniques, were diametrically opposed. The trial judge had read Mr. Von Gemmingen's testimony directly to the jury in his address to them and emphasized that this evidence was "of extreme importance" (p. 181). Hence it seems likely that this emphasis was crucial to the finding of the jury. But Von Gemmingen's "evidence" was based on a conclusion directly contradictory to that of the subsequent finding put forward subsequently by Jervis. Von Gemmingen stated in his testimony that he had never found in all his

experience two different persons with the same hair. On being questioned concerning what he meant by "the same", Mr. Von Gemmingen replied that he meant that two hairs are very similar. Like Dr. Jervis, Mr. Von Gemmingen was questioned whether he was talking about probabilities. Dr. Jervis replied that he could not put a probability number on his finding, but he was making a strong statement nonetheless. Mr. Von Gemmingen replied, "I think I can speak in probabilities with respect to experience and with respect to my opinion, yes." (p. 182). Thus Mr. Von Gemmingen's conclusion was phrased in terms that are equally as strong as Dr. Jervis's language. According to Mr. Von Gemmingen's testimony, is that "the beauty of the comparison microscope" is that when the two hairs are lined up "they are so similar and so the same then you must come to the conclusion that this is the same source." (p. 182). Thus one expert concludes that the hairs in question must come from the same source and the other concludes that it is to all intents and purposes that it is impossible that they could come from the same source.

Although the experts speak from their evidence in terms of probabilities, should we put together our inferences in evaluating their joint argumentation in the same way? Our previous study of inferences from expert testimony suggests rather that plausible reasoning would

be a more useful model. How then can we approach this conflicting network of argumentation in a coherent fashion?

It is interesting to note how Klingele's and Jervis' claims to expert testimony tend to reinforce each other. By itself Klingele's claim to authority is weak in certain respects. It is not too clear exactly what this forensic scientist does for a living, whether for example he is a laboratory researcher or an administrative executive. The conclusions reached by Klingele are based on literature in the field of hair analysis, but it would be better to be assured that this literature was definitely informative and reliable. However Dr. Klingele's key statement is that he supports the method of neutron activation analysis of hair. And at this very point Dr. Jervis, a decisively qualified expert on this technique. Thus the first expert witness bolsters the plausibility of the second.

There could be some danger of a circular argument in this sequence. Since Dr. Klingele admittedly possesses limited expertise, the judge remarks that his evidence must be considered in conjunction with that of the other expert. However, this other expert, Dr. Jervis, is the very authority whom the testimony of Dr. Klingele is supposed to establish as reliable. If the plausibility

of one is dependent upon the plausibility of the other, it is not clear that the plausibility of one can independently support the plausibility of the testimony of the other.

The flaw here seems to be a minor one however in that Dr. Jervis' credentials are very impressive, and are quite plausible as a source of testimony in their own right. Thus neither expert's credibility has to exclusively depend on that of the other. Each is independently plausible as an expert.

Another aspect of the way the judge combines the evidence is notable. The judge combines the two propositions below.

(1) Neutron activation is more reliable than microscopic examination (Klingele).

(2) Neutron activation analysis shows the hairs do not match (Jervis).

The judge is putting these two propositions together in his statement that Klingele's evidence must be looked at in conjunction with that of Jervis. One presumes that (1) and (2) should be rated against a third proposition,

(3) Microscopic examination shows the hairs do match (Von Gemmingen).

But how are we directed to draw a plausible inference from (1), (2), and (3)? The plausible inference to draw from (2) is H (the proposition that the hairs match). The plausible inference to draw from (3) is the negation of H. How to choose? Clearly (1) is meant to tilt the balance of plausibility toward not-H, when taken in conjunction with (1).

However there is danger of a fallacy we have already warned of here, for as DeMorgan pointed out in Formal Logic (1847, p. 281), what experts pronounce separately cannot always be combined by deductive inference. Expert E_1 may assert A and expert E_2 may assert $A \supset B$, but both may disagree that B is true. Where there are many disputants to a question, their views cannot always be combined and inferences drawn that all will agree to. Such an approach may falsely presume agreement or consistency of the group.

Similarly in this case, one needs to be careful in combining (1) and (2), pronouncements of different experts, to draw an inference from the combined premisses. However, in this instance, such a possibly questionable procedure appears harmless, since we have no evidence that Jervis rejects (1) or that Klingele rejects (2). Indeed, to all appearances it seems likely that they would agree. And there is even evidence from Jervis'

statements that he supports (1). We conclude that although the appeal to expertise is making a questionable inference in drawing a conclusion from the combined propositions (1) and (2), there is no fallacy, presuming the agreement of Klingele and Jervis is a reasonable assumption.

The rules of evidence the jury must follow in reaching a decision dictate that the burden of proof is on the prosecuting attorney--the defendant must be presumed not guilty unless evidence "beyond reasonable doubt" shows guilt. In the case of a criminal appeal, the rule is that if newly discovered evidence is strong enough so that it might reasonably affect the verdict of a jury, a new trial should be directed. Certainly then, we can see how the new testimony of Jervis and Klingele was strong enough to throw doubt on the previous testimony of Von Gemmingen.

In this connection, it is interesting to look at the questions and answers in cross-examination of two of the experts. Below are the court reporter's notes of the testimony of Mr. Von Gemmingen (p. 182).

> "Q. All right and in the years that you have been doing this work have you ever found hairs from one person compare the same, microscopically, as we have been speaking about with the hair from another person's head?
>
> A. To the best of my recollection I did not. However I cannot recall, mentally, what I saw five years ago.

Q. Now, you told us this morning that in your experience that as far as you could remember working with hair you had not found hair from one person that was the same as another person's microscopically. You kept using the words this morning, when you talked about hair you found and examined as being 'similar'. Now I wonder if you could explain to the jury exactly what you mean by it and what maybe they could understand by it?

A. Well to me, specifically, hairs are similar to a lay person or anyone else seeing those hairs they may say 'these are the same'. However, since they differ in length, since they differ slightly in their width, since the hairs differ slightly in their colour shade, I cannot say they are the same. All I can say is they are similar to it.

Q. Well, when you establish similarity . . ."

Incidentally, these next questions and answers were questions and answers made in cross-examination. The parts that I have read so far were questions and answers made when he was being examined in-chief.

"Q. Well, when you establish similarity what are you basically establishing, if you agree with me, is that there could be maybe even a strong possibility the hairs come from the same source?

A. That's correct. My understanding of similarities is one step short of positively saying that it came from one particular person.

Q. Right. So you can say 'similarity' and you can talk in terms of possibilities because you have no mathematical and statistical figures at your disposal you may not speak in terms of probabilities, is that correct?

A. I think I can speak in probabilities with respect to experience and with respect to my opinion, yes.

Q. Just before I leave you, I want this clear in my mind that when you think about these similar characteristics and you give an opinion based on

your experience that there is a strong possibility the hairs came from the same source, speaking now of the unknown hairs and the sample hairs from Roberts.

A. Yes

Q. Yes, you mean to say as a possibility that you are not armed with any probabilities for me in terms of mathematical reference?

A. Not with mathematical reference. All I can say is it is highly probable.

Q. Yes, all right, what you are trusting is this scientific intuition that you have developed over the last 13 years, your ability to look at this unbelievably complicated distribution of pigmentation granules, and make some sense out of it?

A. Oh yes, you can. You see this is the beauty of the comparison microscope. You have the one in question and one known hair. When you have them lined up, when you see these pigmentation granules carry over from one-half of the hair to the other half, when they are so similar and so the same then you must come to the conclusion that this is the same source."

From this testimony, and the previous statements attributed to Mr. Von Gemmingen, it is clear that his conclusion is that it is highly improbable that the two hair samples did not come from the same source. However, it is evident from Dr. Jervis' testimony below (p. 181) that he is claiming that it is highly improbable that the two hair samples did come from the same source.

> Q. Well, Doctor, you expressed the opinion . . . that it is very unlikely that the hair said to be microscopically similar to the Appellant's hair is in fact from the Appellant. What do you mean by very unlikely?

A. Surely that's self-explanatory?

Q. Well, perhaps I'm just stupid, then, because it's not self-explanatory to me.

A. Well, if you insist, I would say probably less than one chance in a thousand that you're going to find other hair by chance which is going to look like the Appellant's hair but is in fact not the Appellant's hair, or that in this case that if we had these two hair samples and they looked dissimilar, that they could in fact be from the same person, I'd say the chance of that is very, is very unlikely. I can't put a probability number on it.

Q. But I take it you are not prepared to say that it is not possible, you cannot go so far as to say that it is impossible that this came . . .

A. Very unlikely is a very strong statement. I wouldn't have a good scientific basis. It would be my subjective opinion that, you know, very unlikely is, to all intents and purposes in this case, impossible. I am attempting, I am attempting to phrase here a scientific conclusion.

Certainly then there is a direct inconsistency between Mr. Von Gemmingen's testimony and Dr. Jervis' remarks.

Of course, we already know that the proper legal inference at this point is to move towards appeal. But it may be an interesting exercise to go on and ask how we could manage this expert testimony within the framework of a plausibility screening analysis. How would the analysis tell us how to proceed in accepting what we

can of the expert testimony and still avoid the contradiction posed by the conflict above?

To satisfy our curiosity, let us rate the plausibility of Von Gemmingen's testimony relatively low on a scale of 1 to 10 at 2. Klingele's expertise was less impressive on this subject than Jervis'. Let us rate them at 5 and 8 respectively. Making these presumptions, the analysis runs as follows.

p = Neutron activation analysis is reliable.

q = Comparative microscopic analysis is reliable.

r = Hairs found near the victim were similar to those of defendant.

s = Hairs found near victim belonged to defendant.

Von Gemmingen (2): $q \supset (r \supset s), q, r, s$

Klingele (5): $p, \neg q$

Jervis (8): $p \supset (\neg r \supset \neg s), p, \neg r, \neg s$

	p	q	r	s	~r	~s	~q	q ⊃ (r ⊃ s)	p ⊃ (~r ⊃ ~s)
(1)	T	T	T	T	F	F	F	T	T
(2)	T	T	T	F	F	T	F	F	T
(3)	T	T	F	T	T	F	F	T	F
(4)	T	T	F	F	T	T	F	T	T
(5)	T	F	T	T	F	F	T	T	T
(6)	T	F	T	F	F	T	T	T	T
(7)	T	F	F	T	T	F	T	T	F
(8)	T	F	F	F	T	T	T	T	T
(9)	F	T	T	T	F	F	F	T	T included in (1)
(10)	F	T	T	F	F	T	F	F	T included in (2)
(11)	F	T	F	T	T	F	F	T	T
(12)	F	T	F	F	T	T	F	T	T included in (4)
(13)	F	F	T	T	F	F	T	T	T included in (5)
(14)	F	F	T	F	F	T	T	T	T included in (6)
(15)	F	F	F	T	T	F	T	T	T
(16)	F	F	F	F	T	T	T	T	T included in (8)

	Maximally Consistent Subsets	Rejected Propositions
(1)	p, q, r, s, q ⊃ (r ⊃ s), p ⊃ (~r ⊃ ~s)	~r, ~s, ~q
(2)	p, q, r, s, p ⊃ (~r ⊃ ~s)	s, ~r, ~q, q ⊃ (r ⊃ s)
(3)	p, q, s, ~r, q ⊃ (r ⊃ s)	r, ~s, ~q, p ⊃ (~r ⊃ ~s)
(4)	p, q, ~r, ~s, q ⊃ (r ⊃ s), p ⊃ (~r ⊃ ~s)	r, s, ~q
(5)	p, r, s, ~q, q ⊃ (r ⊃ s), p ⊃ (~r ⊃ ~s)	q, ~r, ~s
(6)	p, r, ~s, ~q, q ⊃ (r ⊃ s), p ⊃ (~r ⊃ ~s)	q, s, ~r
(7)	p, s, ~r, ~q, q ⊃ (r ⊃ s)	q, r, ~s, p ⊃ (~r ⊃ ~s)
(8)	p, ~r, ~s, ~q, q ⊃ (r ⊃ s), p ⊃ (~r ⊃ ~s)	q, r, s
(11)	q, s, ~r, q ⊃ (r ⊃ s), p ⊃ (~r ⊃ ~s)	p, r, ~s, ~q
(15)	s, ~r, ~q, q ⊃ (r ⊃ s), p ⊃ (~r ⊃ ~s)	p, q, r, ~s

If we look over each set, we see that every one rejects a highly plausible proposition of value 8 except (4) and (8). (4) rejects a proposition of value 5, namely ~q. But (8) does not reject any propositions of value 5 or 8. In fact (8) rejects only propositions of value 2. Therefore (8) clearly meets Rescher's requirement of being the maximally consistent subset that allows us to retain the most highly plausible information we can from the original set of pronouncements.

In this case then the plausibility screening analysis presents no surprises. It allows us to accept every proposition

put forward by Klingele and Jervis, and counsels us to reject enough of Von Gemmingen's testimony (q, r, and s) to permit a consistent set of propositions for acceptance. It even allows us to include the hypothetical proposition $q \supset (r \supset s)$ set forward by Von Gemmingen. Notably however, the rejection of the two key propositions r and s is enjoined by the analysis.

This case illustrates a certain weakness of execution in the adversarial method of the judicial system. The judge wrote that new evidence could not be secured prior to the original trial by "reasonable diligence". But we are not told why. Surely the defence could have had the same access to the incriminating hairs as the prosecution. Why did the defence fail to seek out the opinions of other forensic experts in the first trial? Why was neutron activation analysis not even mentioned at the first trial? Why did the judge emphasize the importance of Von Gemmingen's testimony so heavily and so often? Should not the imperfect nature of evidence by expert testimony have been considered? Certainly the essentially contestive nature of plausible inferences from expert testimony should always signal extreme caution in dealing with ad verecundiam arguments.

Rescher's theory of plausible inference does not represent a way to fully resolve the dispute posed by the clash of experts on a topic--it only tells us how to

regulate some plausible inference when we try to maximize plausibility. As the courtroom dialogue shows, the best method is for a third party to continue the dialogue by asking direct questions to the disagreeing experts. The case study also shows that if our games of dialogue are to be of practical import, they should not only contain classical logic, but also some way of ordering the comparative plausibility of statements. Let us now return to a consideration of how the addition of plausibility ordering to games of dialogue affects notions of strategy and circular reasoning.

4.6 Question-Begging as a Defect in Attacker's Strategy

Once plausibility enters the picture in CB, the best strategy is to play off relatedness and corner-filling against plausibility. Save up the highest-plausibility propositions to fill the corners--that is the advice appropriate to a game like CB. So the best strategic procedure is to ask the defender to accept the low-plausibility propositions first. Consider the following proof-strategy.

Example:

$$\frac{\begin{array}{l} A \supset B \\ A \vee C \\ \neg B \end{array}}{C}$$

You know in advance he is inclined to accept ¬B. So you know that once he concedes A ⊃ B, he will be inclined to reject A. But until A ∨ C is put forward, he is unlikely to connect any of this with C. But when A ∨ C is asked, if he is inclined to reject A, he will be inclined to reject A ∨ C because he is of course strongly inclined by strategic considerations to reject C. So whichever of the first two premisses you think will seem most plausible to your opponent, save that one to present last.

Yet in other dialogues, it may be better strategy to always work from the more plausible to the less. Hence the order of the presentation of the premisses is important as a matter of strategy. But the precise nature of that order depends quite directly on the structural rules and the win-objectives of the game one has set out to play. In view of our gained insights into the nature of strategic principles of dialectical games, let us review once again the question of begging the question.

In the game CB, α's general problem of strategy is posed by a kind of situation where β accepts A ⊃ B and α needs to prove B. If α asks for A outright, β will of course refuse to commit himself to it, as a basic principle of strategy. Is α's asking for A begging the question? It seems to be quite like what the original meaning of the phrase "begging for the question which is

at issue" would suggest. And it is, as we have seen, poor strategy. Could it be then that begging the question is a matter of poor strategy rather than a "fallacy" in the sense of some violation of a structural rule of the game being played? After all, an instance of poor strategy is more of a lapse against one's own interests, not an unfair way of somehow using an illegal sequence of proof to defeat one's opponent. Some of these questions appear to have already been raised in the literature on question-begging, indicating disagreements on the subject.

Barker (1976) has proposed the following thesis: the fallacy of begging the question presupposes a context of disputation, a setting in which there is controversy over one or more issues. Barker argues that, outside such a context, the question of question-begging does not arise. Yet he seems to accept the presumption that question-begging is at least in some instances a fallacy or illicit move.

However Robinson (1971, p. 116) accepts and defends the following thesis: no arguments beg the question. Robinson argues (p. 117): "the prohibition of begging the question is not a law of logic, nor a maxim of good scientific method. It is merely a rule of an old fashioned competitive game [the Academic game of elenchus]." Further: "There are only two proper ways of condemning an

argument. One is to say that the conclusion does not follow from the premisses. The other is to say that you do not accept the premisses as true. . . . Begging the question appears to be neither of these. So it is not a proper accusation." (p. 114). Aristotle himself seemed to recognize in Topics 162 b, 31-33, that the characterization in terms of formal disputation is not adequate, and refers the reader to the Prior Analytics account, where begging the question is said to be the attempt "to prove what is not self-evident by means of itself." (B16, 33-38). Robinson (1971, p. 116) argues that this account is a failure because it uses the concept of self-evidence, "which has no application in most of science." Could Robinson be conceding that "self-evidence" does have application in some parts of science--for example, perhaps in the axiomatic presentation of a scientific theory. True, as Mackenzie has already reminded us, there is a difference between the truth of a theory and the well-orderedness of its presentation as an axiomatic system. Could there still be some room for question-begging as a "fallacy" in the latter parts of science? Or perhaps even there is question-begging just a lapse of strategy or presentation rather than a true fallacy, a serious logical transgression worthy of censure?

Returning to α's basic problem in CB again, if

α "begs for" the premiss A needed as his corner to prove B to β, what fallacy does he commit against β? None, it seems. Perhaps a distinction should be made again here, in reminder of our discussion of Mackenzie on petitio, between challenge-busting and petitio principii. More failure to establish a needed premiss may be quite a different sort of failure from petitio principii.

It is naturally very easy to confuse petitio with bereftness of evidence, especially from the point of view of the defender who is strongly motivated to reject the conclusion of an argument he perceives to be valid. Such a type of unjust imputation of begging the question is so common that it might almost be allowed the status of a fallacy in its own right. DeMorgan (1847, p. 255) perceived this phenomenon very clearly when he wrote:

> There is an opponent fallacy to the petitio principii, which, I suspect, is of the more frequent occurrence: it is the habit of many to treat an advanced proposition as a begging of the question the moment they see that, if established, it would establish the question. Before the advancer has more than stated his thesis, and before he has had time to add that he proposes to prove it, he is treated as a sophist on his opponent's perception of the relevancy (if proved) of his first step. Are there not persons who think that to prove any previous proposition, which necessarily leads to the conclusion adverse to them, is taking an unfair advantage?

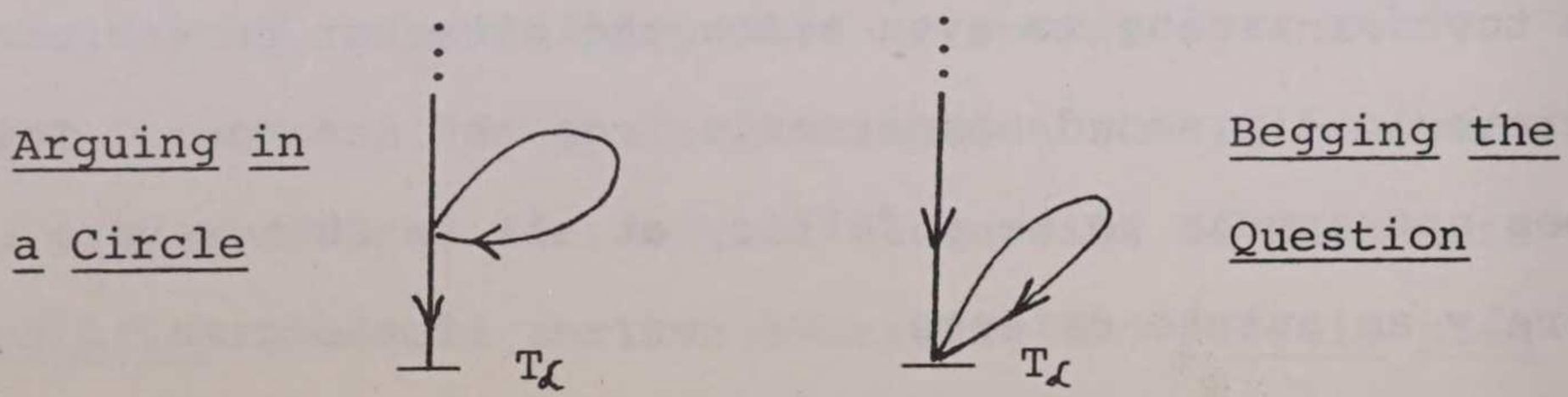
DeMorgan's "opponent fallacy" occurs where the defender is too far-seeing to even allow the attacker to extract strategically sound commitments from the defender. This does not appear to be a fallacy at all in CB however, merely an astute defence. Of course, if the game is to co-operatively prove some thesis, unlike the objectives of the players in the disputational game CB, what DeMorgan refers to could perhaps be an unfair or properly illegal move. In any event, it is certainly distinct from the fallacy more correctly known as petitio principii.

What then is, more correctly construed, the phenomenon of DB that should be called "begging the question". Here I would like to propose that a distinction be made in CB between begging the question and arguing in a circle.

> Conjecture: begging the question involves the thesis at issue, whereas arguing in a circle need not.

The kind of distinction useful to make here involves the position of the thesis to be proven by the attacker in his allegedly circular proof. Arguing in a circle might take place by a circle at some point in the sequence of a proof before the thesis to be proven is ever reached at all. The characteristic loop in the sequence of proof need not include the thesis to be proved, T_{α}, in the case of arguing in a circle. But it must include it to be a

begging of the question (thesis) to be proved.



An example of begging the question would be the argument, '$A \wedge T_\alpha$, therefore T_α'. By utilizing such an argument, α asks β to accept a premiss that involves direct commitment to T_α, presuming '$S \wedge T$, therefore T' is a rule of inference of the game of type CB. From β's point of view however, there need be nothing too deeply wrong about this move, although it represents poor strategy for α. Is it really just a special case of challenge-busting or DeMorgan's "opponent fallacy" that happens to involve T_α? Is this type of move fallacious? It seems hard to see why.

By contrast, arguing in a circle for α is a circular sequence that need not involve T_α. Thus it follows that begging the question is a special case of arguing in a circle. The two proof-sequences below are examples. In (1), the initial premisses are $A \supset B$, A, and $B \supset A$. In (2), the initial premisses are $A \supset B$, A, and $B \supset C$.

(1)

$A \supset B$

A

B

$B \supset A$

A

$A \supset T_{\mathcal{A}}$

$T_{\mathcal{A}}$

(2)

$A \supset B$

A

B

$B \supset C$

C

B

$C \wedge B$

In the case of (2), the sequence of moves is quite acceptable as a proof of $C \wedge B$. $\mathcal{A}$ proved B as an intermediate conclusion first, so it was quite all right for him to use it again as a premiss subsequently. After all, once B had been proven to $\mathcal{B}$ as an instance of a rule of the game, it became a commitment of his. Consequently it was fair enough for $\mathcal{A}$ to use it as a premiss again. Similarly in (1), $\mathcal{B}$ already accepted A as a premiss. But that doesn't mean that $\mathcal{A}$ violates any rule of CB by then proving A as a conclusion. However, one could ask what the point of the exercise is. If $\mathcal{B}$ already is committed to A, why bother to see to it that he is committed to it by proving it? In fact, the first four lines of the proof (1) are redundant strategically, unless they might have served some purpose of spreading or distancing in the overall strategy of $\mathcal{A}$.

It seems then that arguing in a circle doesn't

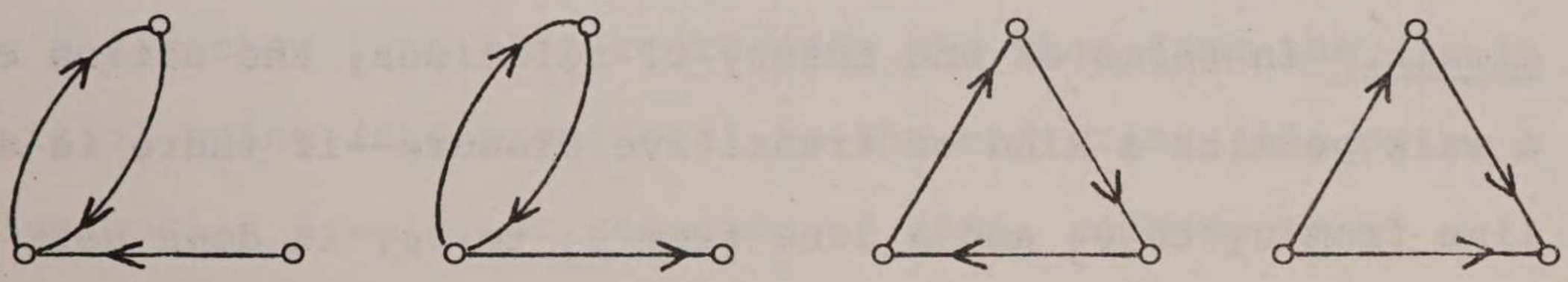
really amount to much in CB. It could be poor strategy if moves are wasted by going in the circle. On the other hand, it could serve as part of a strategy of spreading or distancing, although it does not seem essential to either of these types of strategy. I conjecture by way of conclusion that begging or circularity only become serious fallacies in games of dialogue when other rules or factors external to CB and its extensions we have considered are brought in. So far, the worst we can say about circularity is that it may be poor strategy against one's own objectives of proof in some instances. That hardly seems to qualify as a fallacy worth being on one's guard against an adversary in disputation.

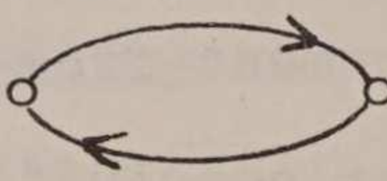
4.7 Graphs of Arguments

A very useful technique in keeping track of linkages of premisses and conclusions is to construct a graph of the argument. The statements represent the points (vertices) of the graph. The lines joining the points represent the line of argument. This technique, now often used in informal logic, was first introduced, it appears, by Beardsley (1950).

In the context of games of dialogue, it is most useful to construct a digraph by letting the points represent statements and the arcs (arrows) represent steps of

valid argument. A directed graph or digraph consists of a finite nonempty set V of points (nodes, vertices, etc.) and a set X of ordered pairs of points. These ordered pairs are called arcs (directed lines, edges). Digraphs are usually drawn as points connected by arrows, as in the illustration below representing the digraphs with three points and three arcs.



A loop is a line that joins a point to itself, e.g. . If more than one line joins two points, e.g.  , it is called multiple lines.

An arc of a digraph can be thought of as a binary relation, and as such its properties are relatively weak as relations go. It need not be reflexive--that is, we can have loops or not as we wish. It need not be transitive--just because there is a line from v_i to v_j and one from v_j to v_k, there need not be a line from v_i to v_k. And it is not symmetrical or asymmetrical. In a (non-directed) graph it need not even be non-symmetrical but in a digraph, it is

non-symmetrical--that is, if there is a line from v_i to v_j, there may or may not be a line from v_j to v_i.

A <u>walk</u> of a graph G is an alternating sequence of points $v_i \in V$ and lines $x_i \in \chi$, $v0$, x_1, ..., v_{n-1}, x_n, v_n, beginning and ending with points, and where each line is incident with the two points immediately preceding and following it. In the theory of directed graphs, each pair is labelled with an arrow so that $\{v_i, v_j\}$ is a different arc than $\{v_j, v_i\}$. Here we speak of a directed walk or <u>diwalk</u>. In terms of the theory of relations, the notion of a walk permits a kind of transitive closure--if there is a line from v_i to v_j and a line from v_j to v_k, it does not follow that there is a line (arc) from v_i to v_k, but it does follow that there is a walk from v_i to v_k. In terms of argument analysis, what this means is that if there is an argument from one premiss-set to a conclusion, and then from that conclusion (as premiss) to a second conclusion, and so forth from that point to some end statement, then we can say after Hamblin that there is a "thread" or "development" of arguments, as we put it earlier a "chain" of argument, from the initial premisses to the end conclusion. In other words, digraph theory models the structure of extended discourse argument analysis very nicely. In graph theory we have the distinction between a walk which may have many intervening arcs, and a "single-step" arc v_i, v_j where there are no

points v_k between v_i and v_j. In the theory of argument analysis, we are back to the distinction--intimately related to Hamblin's notion of immediate consequence--between a single-step argument and chain-like collocation of argument steps to produce a complex argument.

Let's then think of an argument in this graph-theoretic way. Each argument is composed of a set of points which represent bundles of statements that are "premisses" or "conclusions". A pair of points is joined by a directed line that represents the step from the initial point (the premisses) to the end point (the conclusions). A walk, or sequence of arcs, represents a thread of argumentation, a sequence of premisses and conclusions joined together to form a longer chain of reasoning.

In graph theory, a walk is said to be <u>closed</u> if $v_0 > v_n$, and <u>open</u> otherwise. A closed walk with $n \geq 3$ distinct points is called a <u>cycle</u>. For our purposes it is nice to define a <u>circle</u> as a walk that is a loop, multiple lines, or a cycle. In the context of argument analysis, a natural doctrine of circular argument may be formulated as follows. A loop represents an equivalence <u>petitio</u> and a circle of $n \geq 2$ represents a dependency <u>petitio</u>. In looping, one has argued that P on the basis of P. In cycling where $n \geq 2$, one has started a chain of

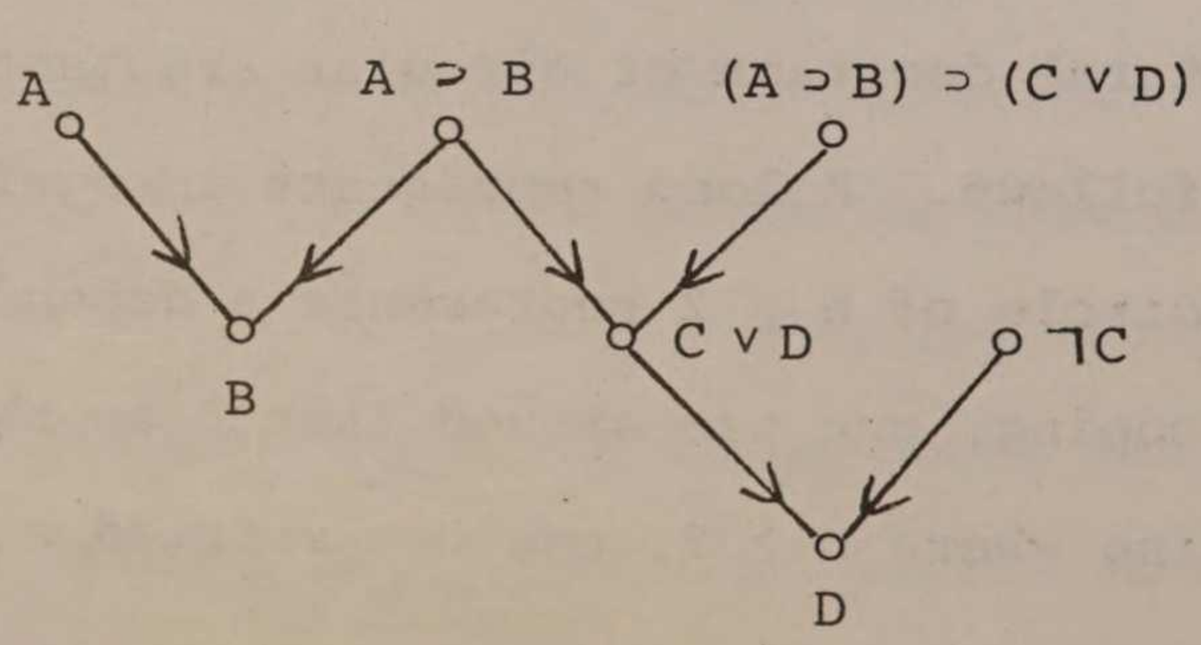
argument with initial premiss P and "arrived back" at final conclusion P.

In the context of games of dialogue, it is useful to define the notion of the graph of an argument more finely as in Walton and Batten (1983). Here an argument is defined as a set of "initial premisses" and a set of rules such that other statements can be generated from these initial premisses and from each other as substitution instances of these rules.

For example, suppose the set of rules contains the two rules below,

$$\frac{S \supset T \qquad S}{T} \qquad\qquad \frac{S \vee T \qquad \neg S}{T}$$

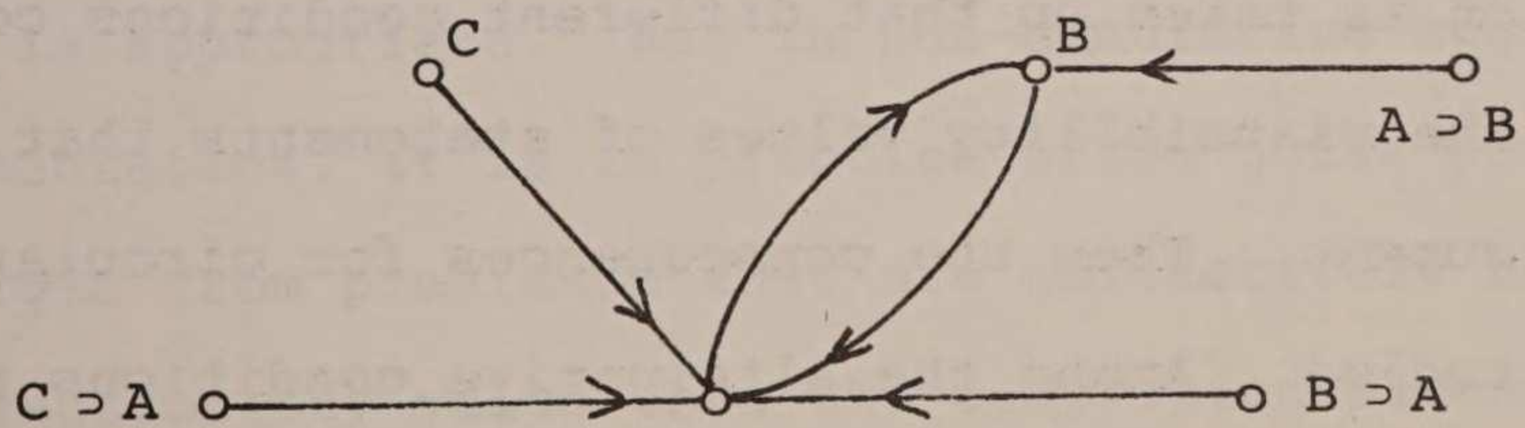
and the initial premisses are (1) $(A \supset B) \supset (C \vee D)$, (2) $A \supset B$, (3) A, and (4) $\neg C$. Then the graph of the argument is below.



Using this technique, we can associate a graph of an argument with a dialogue. We can also model circle-games. According to Walton and Batten (1983), the use of this technique leads to the conclusion that it is very hard to pin down precisely what is supposed to be fallacious about circular sequences in dialogues.

There are instances where arguments are circular, or at least contain circles, but appear nevertheless to be fairly benign rather than vicious. Consider the following dialogue and matching graph, proposed by Walton and Batten (1983).

	WHITE	BLACK
(1)	Why A?	Statement B, B ⊃ A
(2)	Why B?	Statement A, A ⊃ B
(3)	Why A?	Statement C, C ⊃ A



There is a circle (A, B) in the graph of this argument, but it seems a relatively benign one. True, at (2)

White argued in a circle by utilizing A as a premiss. But when queried again at (3), White "broke out of" the circle by providing an evidentiary support extrinsic to the circle. It seems fair to conclude that although a circle may appear in the graph of an argument, it does not follow that the argument as a whole should be considered altogether fallacious.

In Walton and Batten (1983), an inevitable circle is defined as one where every available path of argument to a conclusion is circular. Where the circle is not inevitable, as in the dialogue above, there seems to be less reason to think that it represents a fallacious petitio principii. What then, could be wrong with arguing in a circle?

To approach this question, Walton and Batten (1983) come back to the Aristotelian notion that in a proof, some statements should take precedence over others. The suggestion is taken up that different conditions could be laid on the plausibility values of statements that make up an argument. Then the consequences for circularity can be studied. Among the alternative conditions proposed for study are the following.

(C1) For all A and B, if there is a diwalk from A to B, then the plausibility of A is greater than the plausibility of B.

This condition stipulates a total order on the statements in an argument. As we go along the directed walk on the graph of the argument, we always go from greater to lesser plausibility.

The condition (C1) is a strong one that bans circles altogether in the graph of an argument. If you have A → B and also B → A for example, the first requires the plausibility of A to be greater than that of B, in contradiction to the converse requirement of B → A. By this rule, we cannot consistently assign plausibility values on a graph where there is a circle.

But (C1) would not seem appropriate as a rule for every possible game of dialogue. (C1) does represent one model of argument where the less well established propositions are always based on the better known. In axiomatic presentations of theories where, as Mackenzie pointed out, only lower-numbered theorems can be used to prove theorems, (C1) is appropriate. But in non-cumulative sequences of argumentation, it is in practice often quite permissible to argue from premisses that are collectively no greater in plausibility value than the conclusion based on them. This may occur in a longer sequence of argumentation where intermediate premisses in the sequence may violate (C1). Yet over the whole sequence there could be a linkage of statement that would shift the commitments of the participant

to whom the argument is directed.

Consequently, Walton and Batten (1983) are led to formulate other conditions on plausibility that could be sometimes appropriate to games of dialogue.

(C2) For all A and B, if there is a diwalk from A to B, then the plausibility of A is greater than or equal to the plausibility of B.

This condition, for example, would allow circles. Other variations are also explored. Suppose A is a set of premisses. Then we could require that each of the premisses in A has a greater plausibility value than B. Or we could require that each premiss has at least as great a value as that of B. There are several different approaches, but the question in the background is: which of the conditions are appropriate for different kinds of games of dialogue?

In the end I will reorient the question here altogether by viewing these different types of conditions not as game-rules but as proposals of strategy. However, the appropriateness of different strategies remains dependent on the type of game at issue.

4.8 Case Study: Total Ordering on Plausibility

What practical context could be given for (C1) as a rule of dialogue? Is it ever appropriate to impose a total order in proofs? The following dialogue may illustrate such a context.

Pierre: You foundationalist philosophers are all alike. You all want to find some indubitable bedrock fact on which you can construct a foundation for knowledge. But how can you know beyond all doubt that this basic proposition is true?

Blanche: My basic cornerstone is my knowledge that I myself exist. I can't doubt that, for even the very act of doubting it implies that it must be true. I may be able to doubt the external fact that this piece of wax is in my hand, but I can't doubt that in thinking about it, there is an internal act of conscious thought. I know that I exist when I clearly think of something.

Pierre: Couldn't you be deceived by a powerful but capricious God who makes you think that you know that you exist?

Blanche: Well, yes it is correct that certainty and truth of all knowledge depends on the knowledge of God as the source of that knowledge. Without knowledge of God, you cannot have perfect knowledge of anything else. God is

supremely perfect and could therefore not be a deceiver or the source of error. Therefore the clear and distinct perceptions I have must be true.

Pierre: I see, then. You presume that God exists. And of course then, if a perfect being exists, he could not be a deceiver. Hence your clear and distinct thought that you exist must be true beyond doubt.

Blanche: Yes, if we didn't know that what is real and true in us proceeds from a perfect being, we could never be unconditionally assured of the truth of our ideas, no matter how clearly and distinctly we perceive them.

Pierre: Well and good. But how do you propose to back up this theological premiss? It's hardly something a philosopher these days can take for granted!

Blanche: Well, my general principle is that I can be sure of all things I conceive clearly and distinctly to be true.

Pierre: Yes, you intuitionists always come back to something like that. But what I'm worried about is that this "general principle" is based, in your scheme of things, on a yet unproven theological premiss.

Blanche: Are you asking me how I can prove the existence of God?

Pierre: Well, yes if you like. I mean, your argument seems to depend on it.

Blanche: Well, I don't have to prove it as such. Certainly the idea of a perfect being is something I know directly as a clear and distinct idea.

Pierre: Hold on a bit, Blanche. Do I get this right? You are certain that a clear and distinct idea must be true because of the existence of a perfect being who cannot be a deceiver. But you're sure this God exists and is not a deceiver because you have a clear and distinct idea of him. Is that argument as circular as it sounds? Is that what you really want to say?

Blanche: Well, not the way you put it. We know that God exists because we can clearly reason out proofs for the existence of God as clear and distinct ideas, just as in mathematical proofs. I have such proofs in my stock of arguments, and of course they do not fallaciously presume the existence of God to start with. However, when you remember one of these proofs, you need to assume that God does not deceive you, since otherwise you might be deceived into remembering incorrect information.

Pierre: Are you then saying that knowledge depending on memory must rely on the existence of a non-deceiving God for its trustworthiness. But knowledge of the clear and distinct idea in itself need not rely on the existence of God?

Blanche: Yes, that's it. The reliability of memory is quite distinct from the knowledge of clear and distinct perceptions. So there is no circle.

Pierre: I'm still not too clear about what you are proposing. You are saying that our knowledge of the truth of the existence of a perfect being depends both on our having a clear and distinct perception of it, and also on our memory of that perception.

Blanche: Yes.

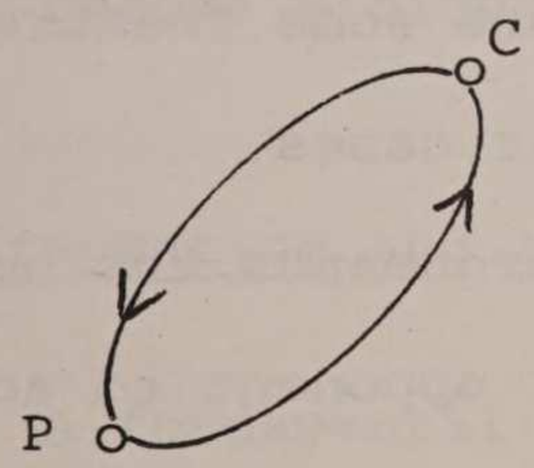
Pierre: But you are still involved in a circle. The claim for a perfect being depends on our memory as well as our clear and distinct perception. But the reliability of memory depends on the existence of a non-deceptive perfect being. You're no better off than before.

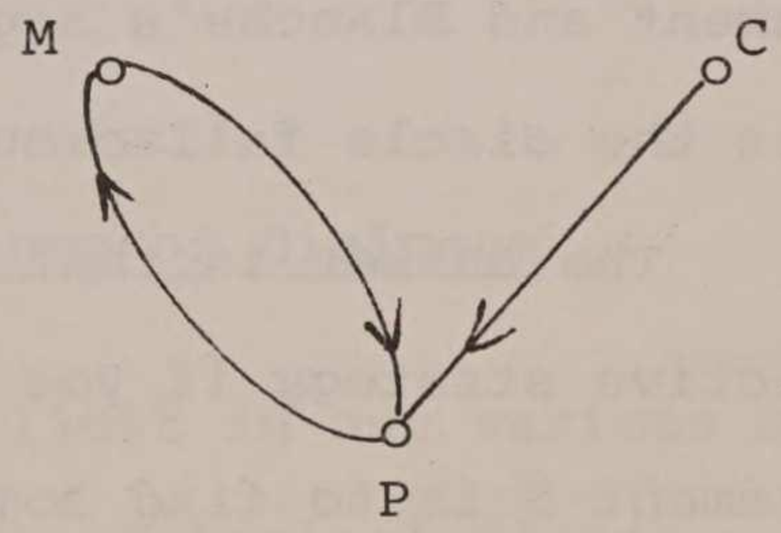
Blanche: Well, yes the inference that God exists does depend on our memory, once we have validated it by reason. For I can't always keep my mind clearly directed to the proofs of the existence of God. Subsequently, the best I can do is to remember the reason why I made that judgement at the time. But when I direct my mind to the proof, just at that time I clearly and distinctly perceive that God exists. In that sense, the knowledge of a perfect being need not always be dependent on the reliability of memory. The proof is there to be rethought, should it be needed to be called to mind again. If I doubt, I can always have recourse to the proof.

Pierre: So the knowledge of a perfect being does depend on memory at some times, but not at all times. The dependency is not everywhere essential.

Blanche: Yes, you've got it!

By way of commentary, it seems that Blanche has started with one argument and then modified it in the face of criticism. A graph of each of these arguments could be set out as below. Let P be 'A perfect (non-deceptive) being exists', M be 'Memory is reliable as a source of knowledge', and C stand for 'What is clearly and distinctly perceived is true'.





At first, Blanche proposed the argument described by the graph on the left. But then she proposed a second more sophisticated argument, like the one graphically represented on the right. At first it seemed that she wanted to argue that P depends for its truth on both M and C. But perhaps recognizing the danger of circularity, she

shifts to saying that P is not, at least always, dependent on M. It seems that, sometimes at least, P can be verified by proof directly from C without the need of M as a premiss. So construed, the circle between M and P is a benign and not a vicious one.

Blanche cannot have it both ways; she is not allowed to base P on C and also C on P without drawing criticism from Pierre. Why is it so? Why was it in 1.2 that the arguments about the flashing lights and the economy of Manitoba could be circular yet not fallacious, while the man on the roof and the store proprietor in the other example involved a fallacious mutual dependency in their collective reasoning. It seems that this latter argument and Blanche's argument share some feature which makes the circle fallacious in their cases.

The answer is that in some arguments the only effective strategy if you want your opponent to accept a statement S is to find some statement T such that S is a consequence of T and your opponent finds T more plausible than S in the sequence of what he is prepared to accept. You must first of all find some propositions your opponent is prepared to accept (as axioms, in effect), and then work your way (by deductive closure in CB) to the next level of what he must now come to accept. Then you must work your way to the next level, and so forth, until you

prove your thesis. But you must never loop back to any previous statement in your sequence of proof.

Practically speaking then, we know that some games of argument take place against a context of CB taken together with (C1) as a strategic rule of ordering plausibility of statements in proofs. Yet we also know that other games of argument take place against a context of CB with some strategic plausibility rule weaker than (C1). Moreover, in real life, unfortunately, the strategic objectives of argument are often not stated clearly or at all. In such cases, clear evaluation of allegations of petitio remains a moot point. Only when the context clearly indicates that (C1) is part of the game does a circle become vicious.

4.9 Pragmatics and the Structure of Dialogue

A fundamental issue implicit in our various modellings of the fallacies by means of logical dialogue-games is the dividing line between semantics and pragmatics. We have seen that the fallacies resist analysis exclusively in terms of classical logic. Some like Hintikka (1979) have therefore suggested that the logic of dialogues must be a non-classical logic. Others have read off the lesson that the fallacies are irreducibly pragmatic in nature, and that classical logic has little to contribute to their

analysis. Contrary to both these expectations however, we have found that classical propositional logic has a fundamental place as a logical element in the use of logical dialogues to model the fallacies. This is not to deny that in some games of dialogue, certain sub-systems of classical logic, e.g. relatedness logic, are more appropriate.

Our approaches to the fallacies have in fact suggested that the notion of a proposition (statement) in its classical guise is the basic concept of the logical game of dialogue. A move in the dialogue-games is a putting forth of a proposition by a player. All our various studies of these games therefore suggests a certain program for the semantics-pragmatics distinction that yields a new approach to the structure of dialectical systems. This program is to take the notion of a proposition as the basic semantic unit. Then we can define the pragmatic notions of 'assertion', 'withdrawal', 'question', and so forth, in terms of additions to and deletions from propositions in the commitment-stores of players in a game of dialogue as they make certain characteristic moves in the game. In short, notions like 'assertion' and 'question' become partly semantic--their core structure is propositional--but they are also partly pragmatic. At least we mean by 'pragmatic' that these

notions are defined with reference to kinds of moves made by participants in a game of dialogue.

We have already defined the basic notions of a game of dialogue, following Hamblin and Mackenzie, and these will be kept the same. Propositions (statements) are denoted by variables A, B, C, ..., and by metavariables S, T, U, ..., in constructing a game. Players are denoted by Greek letters α, β, ... A move in a game is a proposition coupled with a player. A strategy is a sequence of propositions linked together so that each adjacent pair of sets of propositions is closed under immediate consequence (as defined by the rules of inference of the game). A commitment-store is a set of propositions appended to each player.

The new idea to be introduced is that each characteristic type of move in a game functions as an addition to or deletion from the sets of propositions in the player's commitment-stores. Questioning, asserting and withdrawing can now be defined as a type of move in a dialectical game, instead of being characterized in the more usual way as propositional attitudes in some psychological sense. Questions (assertions, withdrawals) are defined as types of moves in relation to two parameters: (i) addition or deletion of propositions in the respective commitment-stores of the players, and (ii) what counts as a permissible next

move in the game.

First we define 'assertion' and 'withdrawal' and then define 'question' in terms of the first two notions. We will take a question to be a yes-no question or a why-question (challenge) because we have CB and its near-relatives primarily in mind. But we could add "whether-questions" and other types of questions if we wish, using similar procedures. Instead of having locution rules, commitment rules, or other kinds of rules, we can simply introduce the following definitions of 'assertion', 'withdrawal', and question in relation to the games we have studied. The four definitions are given as follows.

α asserts S at move i (S is an assertion of α at i) if and only if S is added to α's commitment-store at i (unless it was already included), and i + 1 can be any legal move made by β.

α withdraws S at move i (S is a withdrawal of α at i) if and only if S is deleted from α's commitment-store at i (unless it was not included), and i + 1 can be any legal move by β.

'S?' is a yes-no question asked by α at i if and only if at i + 1 β asserts S, withdraws S, or asserts $\neg$S or his move at i + 1 is illegal.

'Why S?' is a why-question asked by α at i if and only if (i) at i + 1 β asserts T where S is a consequence of T, or (ii) β withdraws S. Unless (i) or (ii) applies, β' moves at i + 1 are illegal.

How each of these definitions works in relation to a particular game may vary. In CB, withdrawal "leaves no traces" other than removing a commitment. In CB(+), withdrawal of S is recorded by 'No commitment S'. If at some later point the same player asserts S, he may be penalized by the strategic rules of CB(+). However, in general, the above four definitions are appropriate for all disputational games like CB and its near-relatives.

The idea behind these definitions is similar to a framework of Stalnaker (1978) where the "presupposition" of a co-operative conversation is described as information that both speaker and audience agree upon. Then according to Stalnaker, the essential effect of an assertion is to add the content of what is asserted to this collective presupposition-set.

Stalnaker does not want to use this account as a definition of assertion, but only as a claim about one aspect of assertion. Moreover, clearly Stalnaker has in mind co-operative (information-oriented) conversational contexts.

But once the disputational context of conversational interchanges is supplied via CB and other disputational games, 'assertion' can be nicely defined as a type of move by a participant in one of these games. In effect then, we have carried over the truth-condition account of meaning

(semantics) into our games of dialogue, thereby producing pragmatic definitions of asserting and questioning. By 'pragmatic' we mean that these concepts are defined as types of moves in a game of dialogue. Hence the study of fallacies becomes properly a branch of pragmatics. Yet such a study is an extension, or perhaps better, an application of logic.

Notes: Chapter Four

[1]Further elaborations of various aspects of these conditions are given in Salmon (1963) and Woods and Walton (1982). See Wesley Salmon, Logic, Prentice-Hall, 1963.

[2]Thus we can see that subject-matter relatedness plays a role in ad verecundiam arguments.

[3]According to 34 C.C.C. (1977, p. 180), Dr. Klingele took "his doctorate in organic chemistry from Cornell University, and from 1965 to 1971 he was Assistant Professor of Pharmacology and Organic Chemistry in the School of Medicine of the University of Louisville. Since 1971 he had been self-employed at H.O.K. Associates in Niagara Falls, New York, specializing in chemical and biological analysis, organic synthesis and forensic science."

[4]According to 34 C.C.C. (1977, p. 180), Dr. Jervis "holds an M.A. and a Ph.D. (1952) in physical chemistry from the University of Toronto, and is the Professor of Nuclear and Radiochemistry (since 1966) in the Faculty of Applied Science and Engineering at that University. He is also Associate Dean of the Faculty, responsible for research and advanced studies, as well as Director of the SLOWPOKE Nuclear Reactor Facility at the University. He holds a number of other important posts in his chosen field and had done extensive research and writing in radiochemical and radioactivation techniques for 26 years."

CHAPTER FIVE: DIALOGUE-GAMES REVISITED

One less than ideal aspect of CB(+) and related games already studied is that the rule for encouraging a player to incur commitments appears somewhat arbitrary. The problem we were faced with was that we wanted to stop a player from always replying 'No commitment S'. By such a "skeptical" strategy, a player can always prevent the other player from winning, but the resulting play would be uninteresting. Since our objective is to model realistic interchanges of disputation in dialogue, CB(+) would seem to be limited because there is no really very strong way for one player to make another player build up his stock of commitments.

Hintikka has a different way of solving this problem. As we saw, an opponent may refuse to answer a question addressed by the other player in a Hintikka game of logical dialogue--see Hintikka (1979, p. 237)--but if he refuses to answer, the negation of the presupposition of the question is added to his commitment-store. For example, if a player fails to answer the question "Who lives in that house?" by supplying the name of some individual who lives in that house, he immediately becomes committed to the negation of the presupposition of the question, namely "Nobody lives in that house." But if he does give an answer, e.g.

"Bob Jones lives in that house," he becomes committed to the presupposition itself, viz. "Somebody lives in that house." It follows then that the questioner has the power to make his opponent become committed to either the presupposition or its negation, for any question he might care to ask.

That the questioner should have the power to pose questions with this much bite is an advantageous feature in modelling certain kinds of dialogue-interchanges. The questioner can press forward with revealing questions and thus the game must move along rapidly if the questioner is skillful. On the other hand, we have seen that the management of question-asking fallacies and ad hominem criticisms suggests some kinds of dialogue-interchanges where the questioner should not always be allowed to press so hard without allowing the answerer defences or escape-routes if they can be justified. In 4.3 we defined the presupposition of a yes-no question 'A?' as the disjunction 'A $\vee$ $\neg$A'. But the negation of this disjunction is '$\neg$(A $\vee$ $\neg$A)' which is equivalent (in classical logic, but not relatedness logic) to 'A $\wedge$ $\neg$A'. Hence in a Hintikka game with rules strong enough to yield classical logic, an answerer who refuses to answer any yes-no question could be shown by his opponent to have become committed to an inconsistency.

Our previous case studies of the fallacies might lead

us to question the universal applicability of this way of managing questions in regard to some of the fallacies. We might not always want to leave this opening to a criticism of inconsistency of position as a burden on an answerer who fails to respond 'yes' or 'no'. Perhaps some milder alternatives should be explored as well. If the answerer in a game of dialogue is not allowed the 'No commitment' option freely enough, he may be in effect forced by the questioner who asks him a yes-no question to reason as follows: "I have to answer yes or no, but I do not have any proof which answer is correct if one is. Either way I answer, I commit the ad ignorantiam[1] of arguing from my lack of knowledge to a definite yes or no."

Clearly a lot turns here on how we define 'presupposition' of a question. In 4.3 we defined presupposition in relation to so-called propositional questions, where the relevant alternatives are propositions. Hintikka (1976) is, however, primarily concerned with wh-questions, where the relevant alternatives are values of a bound variable. That is, a question like 'Who lives here' poses a set of alternative instantiations of the open sentence, 'x lives here.' According to Hintikka (1976, p. 27), the presupposition of this question should be given as '$(\exists x)$(x lives here)'. Thus the presupposition of the spouse-beating question of 1.5 and 4.2 is: $(\exists x)$(you stopped beating your spouse at x), where

values of x are moments of time. This approach to managing the spouse-beating question in dialogue means that the participant who refuses to answer claims, in effect, that there is no such time.

I am not sure yet how this approach can be extended towards a solution to the pragmatics of the spouse-beating fallacy or to ad hominem dialogues, but my own limited concerns in the previous chapters have been with propositional logic and propositional questions and dialogue-games. Moreover, our case studies suggest the interest of a weaker variant of Hintikka's dialogue structure where refusal to answer need not always commit one to a denial of the presupposition of the question asked.

What I shall want to move towards then is a Hintikka dialogue-structure in basic outline with a somewhat different type of question-rule as an option for some contexts of dialogue. Hintikka's own proposal of extending games of dialogue to take into account the tacit knowledge of a participant provides a clue.

5.1 Dark-Side Commitment-Stores

Is there a way to design a game that allows a 'No commitment' reply like CB(+) yet enables one player to more gently extract commitments from the other than Hintikka's method allowed? What about Hamblin's way? Part of Hamblin's

problem with the notion of a commitment-set is that, in real life, an arguer's commitments are rarely a well-circumscribed set that he has clearly in mind. Nor is he always clearly aware of precisely what statements his opponent is committed to. Hence it is hard for Hamblin to say whether commitment-sets should be consistent, closed under implication, etc. But perhaps it is this very fact that commitment sets are not fully known that makes realistic disputation so interesting, or as Hamblin or Hintikka might say, "information-oriented".

Strategy and play in CB(+) and its mates was a simple and somewhat dull and unchallenging affair, from a logical point of view. One player needed to find some corner-proposition that implied his own thesis but that was sufficiently "distant" for his opponent not to perceive it as a corner. Spreading and distancing do reflect not unfamiliar strategies of conversational disputations of a contentious sort where one arguer tries to "trap" the other. Yet it still seems that many conversational dialogues are somehow more deeply revealing or satisfying than play in CB(+) suggests. Could there be a good way to steer a middle course between Hintikka dialogue-games and CB(+) and its near-relatives?

Max Cresswell has suggested[2] that we could think of a commitment-store of a player as having a "dark side" as

well as a "light side". The light side contains the initial commitments of the player, plus all the commitments he has incurred by the commitment-rules during the course of the game. The dark side contains commitments not known to the player or his opponents in disputation. But the commitments on the dark side are a definite set of statements. Moreover, they play a role in the game because certain commitment-rules dictate that under certain circumstances of play, a statement is transferred from the dark side to the light side.

The motivation of bringing in dark-side commitment-sets is that in many familiar arguments we begin and end with the same set of statements, perhaps feeling that the argument really "hasn't gone anywhere". Yet if we think of it, such arguments are often curiously revealing in that they more clearly articulate or make us aware of our own and our dialogue-partner's deeply held commitments not brought out until the argument took place.

CB(+) sharpened the Hamblin notion of a game of dialogue by bringing in strategic rules to define what counts as a "win" and "loss". But perhaps Hamblin is right in the end that if such games are to model realistic dialogues or manage the fallacies in a constructive way, the game should be information-oriented. Perhaps the important thing should not be who wins or loses, at least entirely,

but what the players gain in knowledge from the game. In practice, it is often much easier for an arguer to defend his position if he has fewer commitments, a less vast position to defend against criticisms. This ease or difficulty of winning the argument, varying with the richness of one's commitments could, or perhaps should be reflected in the nature of the game itself. In such a framework, fallacies like petitio principii might make more sense.

Hamblin required that the commitment-store of each player be a set of public statements, e.g. a number of sentences on a slate in public view of all the participants. But even CB(+) and its cohorts suggested that strategies of many conversational arguments turn on the fact that arguer's forget their precise commitments, or lose track of them in a train of reasoning. Therefore, we are proposing that there should be a second slate of commitments for each player. But this second slate is not on public view, accessible to the participants. A player may "dimly remember" some of the statements chalked on these slates, but he has no direct access to check them.[3]

When we say that this "dark" slate is not known to the players, we do not intend some psychological interpretation of it as "lurking in the recesses of the player's mind" or some such thing. We agree fully with Hamblin that there is no place for this sort of psychologism in logical

games of dialectic. The dark-side commitment-set is simply a set of statements, no more no less. The only difference between our approach and Hamblin's in this regard is that the "dark-side" set is not on public view to the players. Members of it only become known to the players during play of the game, according to commitment-rules regulating the transfer of statements from the dark side to the light side of a player's set of commitments.

A basic game of the sort motivated above can be introduced by adding a set of "dark" commitments to the store of each player, but otherwise keeping to the rules of CB. We can now delete Strategic Rule (ii) of CB, and replace it by the following commitment-rule.

(RDS) If a player states 'No commitment S' and S is in the dark side of his commitment-store, then S is immediately transferred into the light side of his commitment-store.

This new rule not only relieves us of the need for the second strategic rule of CB which gave a player one point for every commitment incurred. It also obviates the need for the (+) rule of CB(+). Remember the (+) rule meant loss of points for a player who replied 'No commitment S' but was in fact committed to S. It seems that some new way of doing what the (+) rule did in CB(+) will now be

needed. To work towards accomplishing this, we must evolve a new family of games. The first of this family we call CBV, where the V stands for "veil". (RDS) becomes the sixth commitment rule in CBV.

The Game CBV

Locution Rules

(i) Statements: Statement-letters, S, T, U, . . . , are permissible locutions, and truth-functional compounds of statement-letters.

(ii) Withdrawals: 'No commitment S' is the locution for withdrawal (retraction) of a statement.

(iii) Questions: The question 'S?' asks 'Is it the case that S is true?'

(iv) Challenges: The challenge 'Why S?' requests some statement that can serve as a basis in proof for S.

Commitment Rules

(i) After a player makes a statement, S, it is included in his commitment-store.

(ii) After the withdrawal of S, the statement S is deleted from the speaker's commitment-store.

(iii) 'Why S?' places S in the hearer's commitment-store unless it is already there or unless the hearer immediately retracts his commitment to S.

(iv) Every statement that is shown by the speaker to be an immediate consequence of statements that are commitments of the hearer then becomes a commitment of the hearer's and is included in his commitment-store.

(v) No commitment may be withdrawn by the hearer that is shown by the speaker to be an immediate consequence of statements that are previous commitments of the hearer.

(vi) If a player states 'No commitment S' and S is on the dark side of his commitment-store, then S is immediately transferred into the light side of his commitment-store.

Dialogue Rules

(R1) Each speaker takes his turn to move by advancing one locution at each turn. A no-commitment locution, however, may accompany a why-locution as one turn.

(R2) A question 'S?' must be followed by (i) a statement 'S', (ii) a statement 'Not-S', or (iii) 'No commitment S'.

(R3) 'Why S?' must be followed by (i) 'No commitment S' or (ii) some statement 'T', where S is a consequence of T.

Strategic Rules

(i) Both players agree in advance that the game will terminate after some finite number of moves.

(ii) The first player to show that his own thesis is an immediate consequence of a set of commitments of the other player wins the game.

(iii) If nobody wins as in (ii) by the agreed termination point, the game is declared a draw.

Clearly the main aspect of CBV that makes it so different from CB and CB(+) is the addition of a dark-side commitment set for each player. How this innovation will affect play in CBV and enable us to model the fallacies in a more revealing way are matters yet to be explored. Before going on to such matters, let us review the basic idea behind CBV once again.

The commitment-store of each player is divided into two sides. First, there is the usual set of commitments resulting from concessions made during the course of the game and containing also the initial commitments of the

player. In addition, the commitment-slate of each player has a "dark side"--a set of commitments not known to the player or his opponent. As each move is made in the game, a proposition may come over from the dark side to the "light side" of the commitment-slate. Prior to such a move, the players might not be completely ignorant of the possible contents of the dark side of their own or other player's dark side. In some cases, a player might have a good idea that a certain proposition or its negation may be in his own or his opponent's dark side commitment-set.

As the game progresses, more and more propositions tend to come over from the dark side to the light side if the game is progressing satisfactorily. It may be that at the end of a game, the dark side is empty, for one or both players, and the light side contains a large stock of commitments. In some cases it may be interesting to start a new game with a new set of dark side commitments, while preserving the light side commitment-sets that each player has collected in the previous game. A tournament, or series of such games, might build up rich stocks of light side commitments.

5.2 The Game CBZ

A good deal of our motivation, especially in connection with the ad hominem fallacy, had to do with the ins and

outs of handling different sorts of inconsistencies in the position of a player. What should the penalty for inconsistency of commitments be, if any, and what sort of response is permissible or appropriate from a point of view of the play or strategy of the other player? Our answers to these questions determine whether or how ad hominem attacks can or should be turned into fallacies on the one hand, or legitimate criticisms or refutations on the other.

CBV enables a player to make another player incur light-side commitments, possibly thereby even producing an inconsistent set of statements in that player's light-side position. CBV also enables a questioner to generate ambivalencies (inconsistencies in commitment) by getting S in a player's light-side store even while that player states 'No commitment S'. But what use should a questioner be allowed to put these inconsistencies to in evolving a win-strategy against his opponent? This question, already studied in relation to CB(+) and its cohorts, is raised anew in a different and sharper form in connection with CBZ.

Different sorts of dialogues point to the legitimacy of different ways of managing inconsistency in a player's commitments. In some dialogues, like the Obligation Game, inconsistency means loss of the game. Perhaps in other contexts of reasonable dialogue, a questioner should be

obliged to point out inconsistencies in his opponent's position when he finds them and ask the answerer to resolve them, rather than utilizing the finding of inconsistency as an instrument of the opponent's defeat. In a knowledge-incremental game, such an approach seems reasonable.

One approach of interest could be even to have a game that puts a burden of logic on the shoulders of the questioner to always confront the answerer to resolve an outright contradiction if it is evident in the answerer's response. In this sort of game, the answerer would have a chance to resolve a contradiction if it should appear by one of his responses that he has committed himself both to a statement and its negation, or if he responds ambivalently, 'No commitment' to a query where he can be shown to be committed to that statement. In this sort of game, we could even rule that a player violates a rule of play if he fails to ask his opponent to resolve an obvious inconsistency that has appeared in that opponent's commitments.

Of course, not all reasonable and fair games of dialogue need be so hard on the questioner. But such possibilities are clearly worth considering where the point of the game is the articulation or clarification of commitments in an argument by the process of question and answer. One strong variant of this sort of game is CBZ below.

The Game CBZ

Locution Rules

(i) Statements: Statement-letters, S, T, U, . . . , are permissible locutions, and truth-functional compounds of statement-letters.

(ii) Withdrawals: 'No commitment S' is the locution for withdrawal (retraction) of a statement.

(iii) Questions: The question 'S?' asks the hearer whether or not he wants to reply that S is true.

(iv) Challenges: The challenge 'Why S?' requests some statement that can serve as a basis of proof for S.

(v) Resolutions: The resolution 'S, ¬S?' requests the hearer to select exactly one of the pair {S, ¬S}.

Dialogue Rules

(i) Each speaker takes his turn to move by advancing exactly one locution at each move.

(ii) A question 'S?' must be followed by (i) a statement 'S', (ii) a statement '¬S', or (iii) 'No commitment S'.

(iii) 'Why S?' must be followed by (i) 'No commitment S' or (ii) some statement 'T'.

(iv) For a speaker to legally pose a resolution-request 'S, ¬S?', the hearer must be committed to at least one of the pair {S, ¬S}.

(v) A (legal) resolution-request must be followed by a statement 'S' or a statement '¬S'.

(vi) If a statement S and also its negation ¬S become included in the light side of a player's commitment-store, the opposing player must pose a resolution request 'S, ¬S?' at his next free move.

(vii) If a speaker states 'No commitment S' but S is in his light-side commitment store, the hearer must pose a resolution request 'S, ¬S?' at his next move.

Commitment Rules

(i) After a player makes a statement, S, it is included in his commitment-store.

(ii) After the withdrawal of S, the statement S is deleted from the speaker's commitment-store.

(iii) 'Why S?' places S in the hearer's commitment-store unless it is already there or unless the hearer immediately retracts his commitment to S.

(iv) Every statement that is shown by the speaker to be an immediate consequence of statements that are commitments of the hearer then becomes a commitment

of the hearer's and is included in his commitment-store.

(v) No commitment that is shown to be an immediate consequence of statements that are commitments of the hearer may be withdrawn by the hearer, unless the speaker agrees.

(vi) If a player states 'No commitment S' and S is included in the dark side of his commitment-store, then S is immediately transferred into the light side of that player's commitment-store.

(vii) Whenever a statement S goes into the light side of a player's commitment-store, if its negation ¬S is on the dark side of that player's store, it must immediately be transferred to the light side. Similarly, S must go from the dark (if it is there) to the light side as soon as ¬S appears on the light side.

(viii) No commitment may be added to or deleted from a player's store except by one of the above six commitment rules.

Strategic Rules

(i) Any player who makes a move other than those permitted by the six dialogue rules immediately loses the game.

(ii) The first player to show that his own thesis is an immediate consequence of a set of light side commitments of the other player wins the game.

(iii) Both players agree in advance that the game will terminate after some finite number of moves.

(iv) If nobody wins as in (ii) by the point agreed on in (iii), the game is a draw. Or if it becomes evident to all the players that the dark sides of their commitment-stores are empty, the game may be ended by universal consent. In the latter case, the players may agree to maintain their light side commitment-stores and begin with a new set of dark side commitment-stores.

CBZ has several interlocking rules that make the sequence of play following a question conform to a certain characteristic pattern.

In answer to a yes-no question of the form 'S?' a player must reply (a) 'S', or (b) '¬S', or (c) 'No commitment S'. If a player takes option (a) and replies 'S', and ¬S is on the light side of his commitment-slate, then the opposing player must make the reply 'Resolve whether S or ¬S'. If a player takes option (a) and replies 'S', and ¬S is on the dark side of his commitment-slate, then ¬S is transferred to the light side of his commitment-slate.

Consequently, the opposing player must make the reply 'Resolve whether S or ¬S'.

If a player takes option (b) and replies '¬S' then similar replies by the opposing player are obligatory if S is on the light or dark side of the first player's commitment-store.

Suppose a player takes option (c) and replies 'No commitment S'. If S is on the light side of his commitment-store, then the opposing player must reply 'Resolve whether S or ¬S'. If S is on the dark side of the answerer's store, then S is transferred over to the light side and the questioner must then move by saying 'Resolve whether S or ¬S'. Any player who fails to comply by making the required type of legal move at any point in one of these sequences loses the game.

How such a characteristic sequence must unfold is illustrated by the following flow-diagram (figure 1). How each next sequence of moves in CBZ is determined by the rules is shown on the figure. The rule-numbers given in the subsequent description of this process are locution rules (L-rules), dialogue rules (D-rules), commitment-rules (C-rules), or strategic rules (S-rules), as numbered in CBZ above.

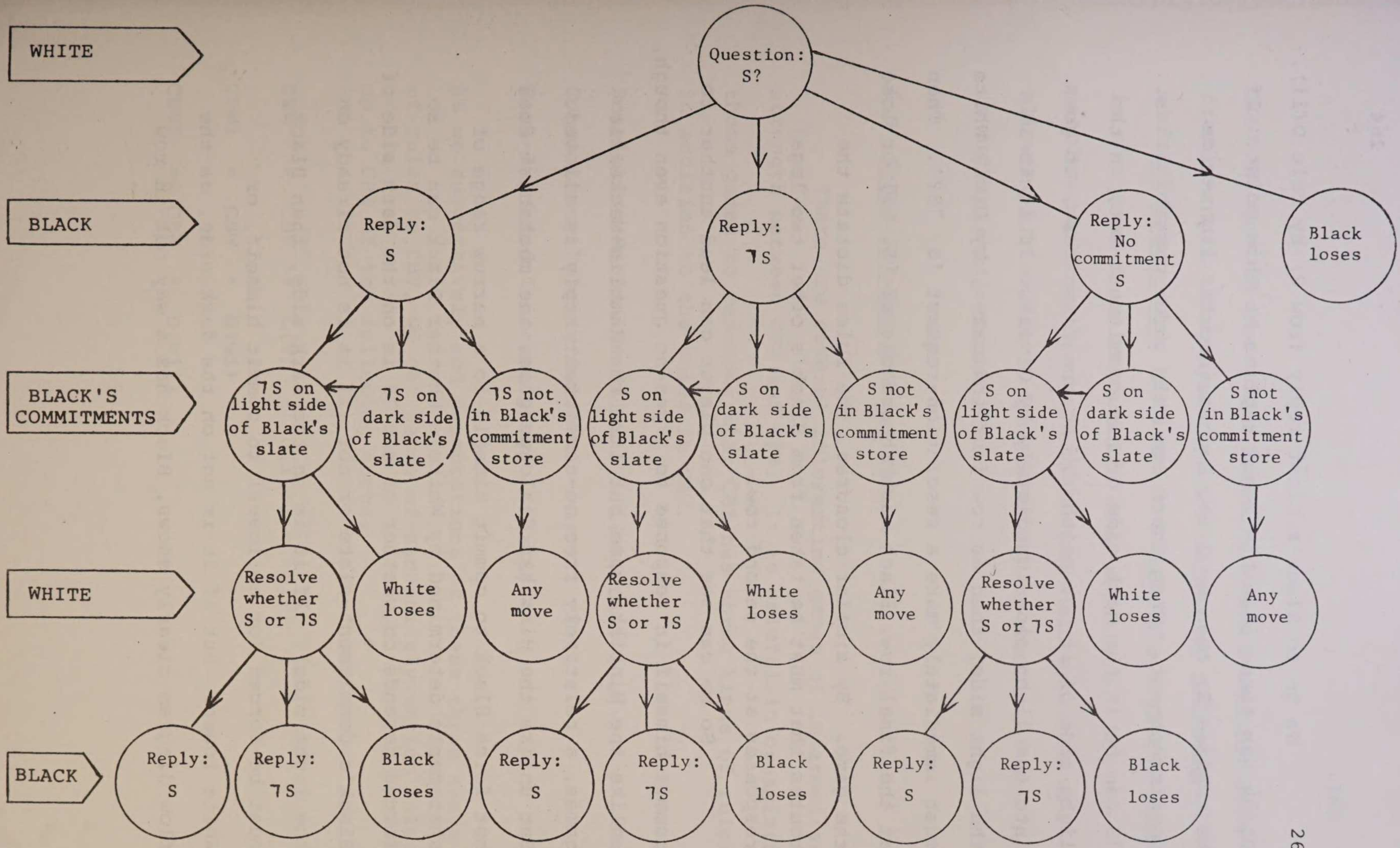

WHITE
Question: S?
BLACK
Reply: S
Reply: ¬S
Reply: No commitment S
Black loses
BLACK'S COMMITMENTS
¬S on light side of Black's slate
¬S on dark side of Black's slate
¬S not in Black's commitment store
S on light side of Black's slate
S on dark side of Black's slate
S not in Black's commitment store
S on light side of Black's slate
S on dark side of Black's slate
S not in Black's commitment store
WHITE
Resolve whether S or ¬S
White loses
Any move
Resolve whether S or ¬S
White loses
Any move
Resolve whether S or ¬S
White loses
Any move
BLACK
Reply: S
Reply: ¬S
Black loses
Reply: S
Reply: ¬S
Black loses
Reply: S
Reply: ¬S
Black loses

Figure 1.

We go to Black's first reply (row 2) by rule D(ii). Black has three possible legal replies at this point. If he replies S, then by C(i), S goes into his light-side commitment-set. Then there are only three possibilities. ¬S can be in the dark side of his commitment-set, in the light side of it, or neither. In the first case, it goes into the light side immediately by C(vii). If it is in the light side, then as row four indicates, by D(vi) White must immediately make a resolution-request 'S, ¬S?'. Then at the final row, Black must choose one of {S, ¬S} or lose the game. By similar closures, the rules dictate the routes that must be taken from Black's other two legal responses at the second row.

So we can see that one player can lead another to commit himself in response to a yes-no question even though, unlike the Hintikka game but like the Hamblin-Mackenzie games, a relatively free no-commitment reply is allowed. But unlike the Hintikka dialogue-game, the mechanism does not force Black to commit himself to a narrow range of statements determined by White. Whether Black can be so forced depends on whether or not ¬S is on the dark side of Black's commitment-slate or not (if it is not already on the light side). If it is on the dark side, then Black must be forced (or he loses) to commit himself, or White loses. But if it is not on the dark side, as the flow diagram clearly shows, Black has a way out in row

four on each of the three leftmost trees branching down from row two. Consequently, the danger of flirting with ad ignorantiam implicit in Hintikka's dialogue-games is not present in CBZ and its near-relatives. Yet the problem implicit in the Hamblin-Mackenzie approach of allowing the answer a free-floating no-commitment way out is sufficiently closed off.

5.3 Games Between CBV and CBZ

There are several interesting games of intermediate strength between CBV and CBZ. It is helpful in organizing these games to remember that CBZ has three kinds of rules in addition to the rules in CBV.

Resolution-Mechanism Rules:	L(v), D(iv), D(v).
Consistency-Forcing Rules:	D(vi), D(vii).
Dark-Imported Inconsistency:	C(vii).

As we successively add permutations of these three kinds of rules to CBV, we get games of ascendingly strict rules up to CBZ of the following sorts.

CBW = CBV + L(v) + D(iv) + D(v)

CBW1 = CBW + D(vi)

CBW2 = CBW + D(vii)

CBW3 = CBW + D(vi) + D(vii)

CBX = CBW + C(vii)

CBX1 = CBW1 + C(vii)

CBX2 = CBW2 + C(vii)

CBY = CBV + C(vii)

CBZ = CBW3 + C(vii)

In fact then, we can see that CBZ = CBW + D(vi) + D(vii) + C(vii). The inclusion relationships ascending up from the weakest game CBV to the strongest game CBZ, can be drawn on the graph, figure 2 below.

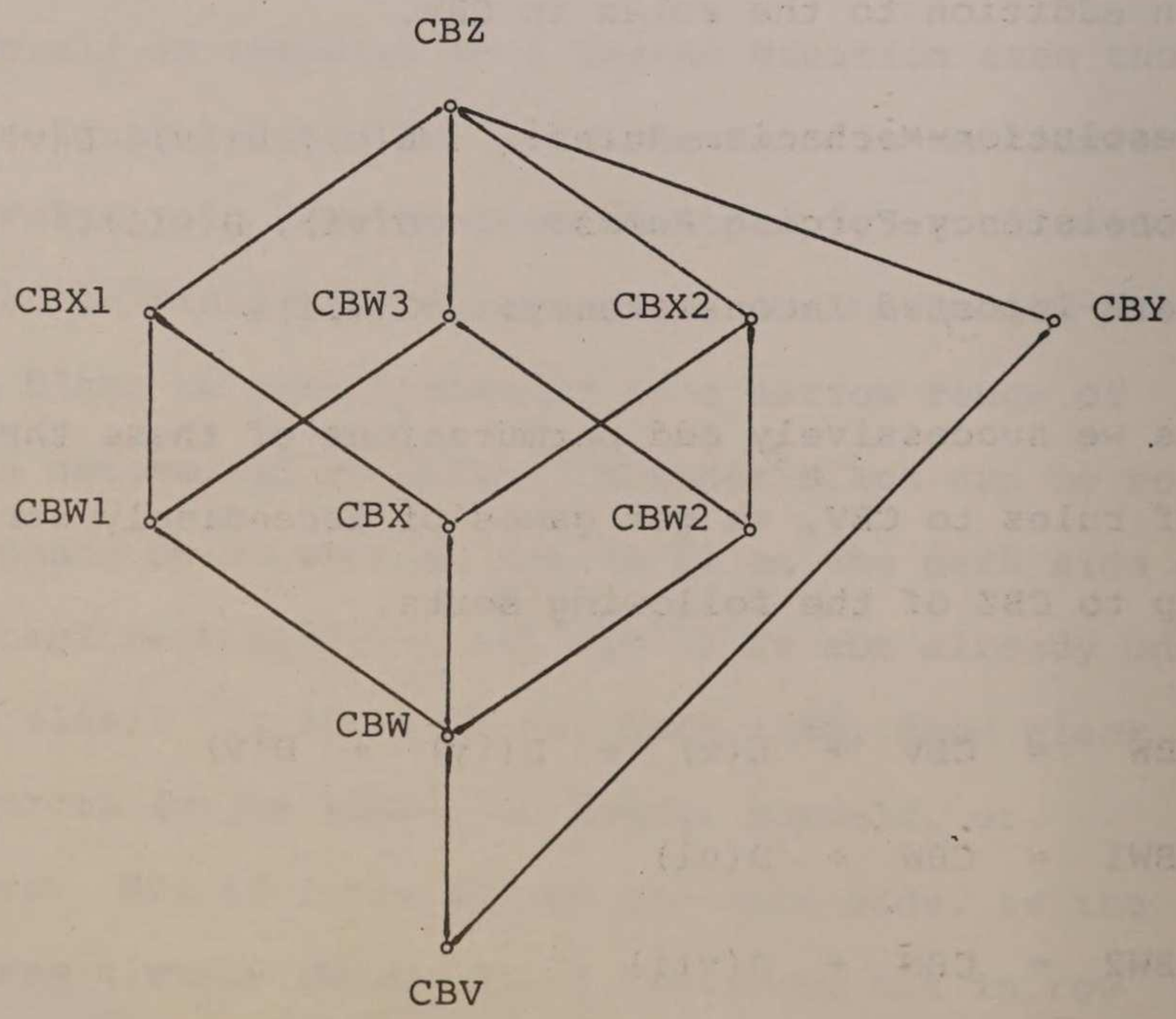


Figure 2.

As a class of games, CBY and the CBX-games CBX1, CBX2, and CBX, are quite interesting. In this class of games the questioner is not forced to resolve inconsistencies or ambivalences in his opponent's commitments. He may move to resolve them if he wishes, but he is not required to by any rule of these games. In this class of games, the burden of strategy is on a player to try to preserve consistency and avoid or eliminate ambivalence in his <u>own</u> commitment-store, at risk of swift defeat by his adversary. In the CBW-games, including CBW, CBW1, CBW2 and CBW3, there are no inconsistencies imported from the dark side of one's slate. But a questioner or answerer may still have to worry about ambivalences in his or his opponent's commitment-sets, or inconsistencies that may have appeared on the light side by moves incurring or retracting commitments.

Each of these games has a different method of inducing and managing commitments, yet each game has clear win-rules and strategies without forcing <u>ad ignorantiam</u> inferences on the part of an answerer. How these different combinations of rules affect play and strategies and consequently affect the modelling of the fallacies is an interesting study. I propose it as the best program for research on these fallacies.

Adding dark-side commitments does not directly affect the basic outlines of strategy too strongly. At

least, the sorts of strategies studied in earlier games lacking an (RDS) rule remain, by and large, appropriate. For example, let us consider how strategy would work in the Republic of Taronga game of 3.2 if the rules of the game of dialogue were those of CBZ. White might still consider $D \supset B$ as a connecting premiss to add to Black's premisses $B \supset A$, $(A \wedge B) \supset C$, and D, in order to prove B by modus ponens. But he would still reject such an obvious strategy. Reason: even if $D \supset \neg B$ turned out to be in Black's dark-side commitment-store, Black could answer White's resolution-request '$D \supset \neg B$, $\neg(D \supset \neg B)$?' by conceding $\neg(D \supset B)$ with no strategic harm or loss to his position. After all, Black already accepts D and B. If Black is reasonably attentive, White is no further ahead by this sequence of moves.

Hence strategies are essentially similar in the new games with (RDS). In Republic of Taronga for example, White should still look for some more distant premiss like $D \supset \neg(B \wedge C)$ as a best corner for his win-strategy.

Allowing dark-side commitment-stores in games of dialogue makes for a reasonable way of allowing 'No commitment' replies to yes-no questions without allowing the answerer too much freedom to avoid answering any question put to him. And this is one way to solve the problem posed by the spouse-beating question. As we saw in 4.3,

the other way to solve the problem is to adopt as a rule of dialogue that a question may only be asked if its presupposition is already a commitment of the answerer. We noted in 4.3 however that this solution is too strong, because it would make it very difficult for the questioner to ask non-innocuous questions unless he already has a large corpus of his opponent's commitments to work with.

This second solution, it should now be noted, also stands to benefit considerably from the introduction of dark-side commitment-stores for the players. If all the dark-side commitments are allowed in along with the light-side ones as statements that qualify as presuppositions for allowable questions, a questioner could have much more latitude to frame questions that could play an effective role in his strategies.

However, this second solution, as it stands, is still not too favorable. For neither player knows his or his opponent's dark-side commitments. And if a player asks a question with a presupposition that is not in fact in his answerer's commitment-store, by this second proposal, that questioner makes an illegal move and loses the game forthwith. This seems a little inhibiting to the asking of probing questions in the dialogue, to put it mildly. Yet there may be a way of saving this solution if some penalty weaker than immediate loss of the game could be

non-arbitrarily devised. Since we see no good way of doing this, and since we favor the other solution anyway, no further work on the second solution will be pursued, despite its attractive features in some contexts of dialogue.

Strategy in games of dialogue is dominated by considerations of cumulativeness. For as we saw in previous games, the allowance in the rules of a game for retractions of commitments is of paramount importance in win-loss determinations. If a player sees that his opponent has extracted from him a set of commitments that imply the opponent's thesis by the rules of the game, that player will, if he wants to defend his position against defeat, immediately retract one or more of these commitments. In order to forestall such evasive tactics, the attacking player must seek to extract commitments that are non-retractable (inerasable). However, in a completely non-cumulative game, there are no inerasable commitments for a player, except of course his own thesis. This leaves little room for "fixed points" in an attacking player's search for good strategies, and as we saw in chapter four, he must adapt his play to the realities of such a moveable position on the part of his adversary in dialogue.

In CB and its extensions CB(+) and CBV through CBZ,

strategy is made a good deal easier for an attacker (and harder for a defender) by the inclusion of C(v). This rule, we remember, means that any statement shown to be an immediate consequence of a player's statements that are commitments then itself becomes an inerasable commitment of that player. For example, suppose modus ponens is a rule of the game, and I have made statements 'A' and 'A → B'. Then suppose that you show by applying modus ponens and C(iv) that B is also a commitment of mine. Then by C(v), I can never retract B from my commitment-store at any subsequent point of the game (unless my opponent agrees in CBZ, but no strategically-minded opponent would ever agree). And by C(iv), I have no choice but to accept B, once you have shown that it is an immediate consequence of other statements that are my commitments.

Taken together with C(iv), C(v) is quite a strong rule in its way, and it would be interesting to investigate games that entirely lack such a rule. (H), of course, would be one example of such a game. Other examples would be CB-type games with C(v) deleted as a rule: CB_0 = CB - C(v), CB_0(+) = CB(+) - C(v), CB_0V = CBV - C(v), CB_0W = CBW - C(v), CB_0W1 = CBW1 - C(v), . . . , CB_0Z = CBZ - C(v). Hence ascending from CB_0W to CB_0Z we have the family of games CB_0W1, CB_0W2, CB_0W3, CB_0X, CB_0X1, CB_0X2, and CB_0Y. In all these non-cumulative games, a player can erase as

many of his commitments as he might care to at any free move. The difficulty in winning this sort of game against a player who is moderately astute or experienced in strategy is formidable indeed. Perhaps it would not be very realistic to expect either player to win very often in this type of game.

In the CB_o family of games play might be made more interesting by having both players start the game with a certain fixed set of inerasable commitments. Another approach might be to have the players "trade off" inerasable commitments. For example, a player could move by offering: "If you'll designate your commitment A as inerasable, I'll designate my commitment B as inerasable."[4] At any rate, some convention of one of these sorts would make the CB_o games more likely to admit of interesting strategies for experienced players. The strategy sets discussed in 3.7 are still applicable to the CB_o games, but those strategies are much more likely to lead to interesting play between experienced and sophisticated players if one of these sorts of convention is added to the game.

What modifications of strategy are entailed by the new dark-side position games CBV through CBZ? First, we should note that without the dark-side commitment-store, genuine immediate ambivalence requiring resolution could

never occur during any play of these games.

There are two types of cases where immediate ambivalence can occur. First, there is the case where a player moves 'No commitment A' but A is a non-erasable commitment in his store by virtue of the application of C(iv). In this instance, the player loses the game, having violated a rule of play. Second, there is the case where a player moves 'No commitment A' but A is an erasable commitment in his (light-side) store. A is then simply removed. The ambivalence is, as it were, prevented before it could occur.

Thus genuine immediate ambivalence can never be imported into the commitment-store of a player by his own no-commitment move. It could only occur if the player was already committed to a directly inconsistent pair of statements at the beginning of play in the game, prior to the initial move. In such a case, a player is immediately ambivalent whether he retracts commitment from the statement in question or its negation.

But a player could move to create an indirect ambivalence in his position. For example, suppose Black has conceded A and A → B but then moves by replying 'No commitment B'. What should White do in a case like this? Since the ambivalence is non-immediate (non-direct), he is under no obligation by any rule of CBV, or any of its

extension-games, to require Black to resolve the "inconsistency".

We are presuming here that modus ponens is a rule of inference of the game. So certainly White could induce direct ambivalence in Black's position, by one move.

It might be interesting to consider games with C(iv) but with some rule weaker than C(v). The rule C(v) means that a commitment is forever inerasable if it is shown by one's opponent to be a direct consequence by a rule of one's commitments. In terms of modelling realistic argumentation, this rule is a little harsh. Perhaps one should have the option of retracting such an induced commitment, but at a penalty. One penalty could be as follows. In order to retract the commitment, first you have to retract one or the other of the premisses used by your opponent to induce the commitment. Then, in a subsequent move you can follow up by retracting the commitment if you wish.

An example may help. Suppose your opponent uses your commitments A and A → B and the rule of modus ponens to immediately deduce B. By C(iv) and C(v), you are inerasably committed to B. But in a new type of game with the more relaxed rule, you would be permitted to retract B. First, however, you would have to retract at least one of the pair {A, A → B}, whichever you choose, and then you could have the option, at your next free move, of retracting B.

The suggestion then is that in CBV and its extensions we replace C(v) by the rule below.

> CW(v) No commitment that is shown to be an immediate consequence of statements that are commitments of the hearer may be withdrawn unless (1) the speaker agrees, or (2) in a move prior to retracting the immediately consequent commitment, the hearer retracts at least one of the statements used by the speaker as his set of commitments to yield the immediately consequent commitment.

The rule CW(v) may seem a little weak at first, but we can readily see its strategic bite if we go back to the illustration furnished by White's best win-strategy in Republic of Taronga set out in 3.2. Let's look at the play at step 8. of White's proof. Suppose Black sees he is about to be undone at step 8. That is, Black sees that once he accepts $B \supset (B \wedge C)$, he has lost the game at the next move. Black now realizes that he has already conceded $\neg(B \wedge C)$ at step 5., and that $\neg B$, White's thesis, is an immediate consequence of $B \supset (B \wedge C)$ and $\neg(B \wedge C)$ by the rule modus tollens. Now Black had already conceded $B \supset C$ at his previous reply (step 7.). By C(iv), since Absorption is a rule of the game, he has no choice now but to concede $B \supset (B \wedge C)$ in response to White's move: "You accept $B \supset C$, and by Absorption, $B \supset (B \wedge C)$ is an immediate consequence of $B \supset C$; therefore you must accept

$B \supset (B \wedge C)$." And once Black accepts $B \supset (B \wedge C)$, White has the option at the next move of forcing Black's concession to $\neg B$.

What happens at this juncture of the game is therefore crucial. If Black didn't have to accept $B \supset (B \wedge C)$ at 8., he could easily destroy White's strategy. But by C(iv) had has to accept it. If Black could retract before White can make his move of step 8., he could also upset White's elaborately engineered strategy. But by C(v) he cannot retract $B \supset (B \wedge C)$ unless White agrees.

Now let's consider what happens when CW(v) is substituted for C(v) as the operative rule of the game. At 8. Black has to accept $B \supset (B \wedge C)$, but suppose that he can, at the same move state 'No commitment $B \supset C$'. Then at the next move, he could retract $B \supset (B \wedge C)$ by applying CW(v). But by then, presumably it would be too late for White would have taken his opportunity at his previous move to force Black to accept $\neg B$ by C(v) using <u>modus tollens</u>. So CW(v) does have bite in enforcing commitments and in allowing players to pursue strategies of the sort we have become familiar with. In effect, the implementation of clause (2) of CW(v) by a defender causes him enough of a delay so that the other player can still marshall an effective strategy if he has one.

Another question raised by the example above is that of the nature of "turn-taking" by each player in a dialogue.

If the answerer must simply give his answer 'Yes', 'No', or 'No commitment' to every question, and then immediately answer another question, one player--the questioner--could conceivably remain "in the driver's seat" for the whole duration of the game without allowing the other to even get his strategy started. In Republic of Taronga for example, White, once started as questioner, could go through his entire nine-step strategic proof and defeat Black before Black could even ask one question. This approach is hardly fair or conducive to interesting play.

Consequently, I prefer to interpret turn-taking in all CB-games and their extensions as follows. One player, say White, begins the game by asking a question or perhaps by making a statement or some other move. At his turn, Black must reply to the question, according to the rules. But included in that same move, Black may also have the option of adding one other locution to his reply, possibly a question or a 'No commitment' move. Then at his next move, White must respond legally to Black's move, e.g. answer his question, if Black asked a question. But White also has the option of adding another locution along with his answer, at that same move.

A good example would be the final stages of White's strategy as played out in Republic of Taronga above. Black had to concede $B \supset (B \wedge C)$ when White used C(v) and C(iv)

to immediately deduce it from Black's previous concession of $B \supset C$. But Black was allowed to add one other locution to his response in addition to "Yes, I accept $B \supset (B \wedge C)$". Thus Black had the option of adding, at the same move, "No commitment $B \supset C$". In effect therefore, we are ruling here that every move except the initial move may consist of two separate locutions, at the option of the player who responds. The first locution is limited by the rules to certain "legal" responses. The second locution is less limited and can be described as a "free move" though it may be subject to certain special limitations, for example in the case of CW(v).

5.4 Ad Hominem Criticisms Reviewed

The earlier games CB and its cohorts from the last chapter are helpful in revealing the character of ad hominem criticisms by filling in the dialogical background of the advancement and management of these criticisms. We can now distinguish between an ad hominem attack or allegation and an ad hominem criticism of an arguer's position. And considerations of strategy in these games showed us why it might be considered a reasonable part of a conception of argument to take seriously the criticism that one's position in the argument is inconsistent. Now too we can clearly see what it means to claim that an ad hominem

attack can be justified as a successful refutation of an arguer's position.

Moreover, our knowledge of the ad hominem is enriched by our newly-found capability to see that ad hominem criticisms can be handled in different ways in different dialogues. In the earlier dialogues, a positional inconsistency committed meant virtually immediate loss of the game for the offending player. But is that way of managing ad hominem as a refutation too abrupt? Should the arguer criticized be left more room to defend his position? If so, the newer games are better models. In these games, as we saw, positional ambivalence or inconsistency of a direct (immediate) sort in a player's commitment-set must be pointed out by the other player. Then the first player gets a chance to resolve the inconsistency. If he fails to do so, then, and only then, is he refuted.

Of the options offered by these various games in the way of managing positional inconsistencies of the different sorts, which is the best for modelling ad hominem argumentation? The best answer is that none of them is universally applicable to all realistic contexts of dialogue. Participants in argument should make it clear at the outset which conventions apply. But if they do not, as most often happens in real disputes and arguments, then a decision must be made on which model of dialogue sets the rules.

For example, we must decide on whom the burden of proof should rest in challenging or resolving immediate inconsistencies of position--the attacker or the defender. If the participants themselves fail to agree on this procedural issue, we should move towards adoption of models of the weaker (less regulated) games. In ad hominem disputes, this tends to mean that the burden of resolving inconsistencies of position is incumbent upon the player who has taken that position. I would say that this is as it should be.

Yet in one respect, the models of ad hominem disputes yielded by the previous chapter were inadequate. In managing realistic ad hominem allegations and disputes, we saw that the main problem is in determining whether or not a statement at issue really does belong to the position of a disputant. In practice, many arguments take place in realistic circumstances where one player does not fully know the commitments of the other, or perhaps does not even fully know his own position in the argument. Yet most often in arguments we do have some plausible, even if perhaps dim idea of where we or our opponents stand in an argument on a topic.

It is in such circumstances that the games with the rule (RDS)--namely CBV and its extensions--provide the best model of ad hominem disputations. In the father-son

dispute on smoking in 1.1 for example, we want to ask: does the father's action of smoking indicate, according to reasonable standards of criticism, that commitment to smoking as a practice is part of his position? The best answers take into account the realities of the situation suggested by the given description of the argument--we don't really know, although engaging in the practice of smoking seems to make it plausible that one may have some commitment to the practice. Then one should either be prepared to defend or clearly reject presumption of commitment. But one may simply not know enough about the smoker's position to say for sure. Perhaps the smoker hasn't even thought about it much himself. Whether he can defend his practice of smoking in relation to his own practice, given his anti-smoking diatribes to his son, may be a matter he has not deeply questioned. Much turns here on the general considerations of how one's actions express one's position on an issue, studied in Walton (1983), but not here.

The same kind of problem was seen to be involved in the argument of the Catholic in 1.1 who is criticized for allegedly failing to agree that abortion is wrong. Suppose the objection is made as follows: "You, a Catholic, of all people, think that you can have an abortion because your fetus has a birth defect. Abortion is contrary to the

Catholic position, and you're being inconsistent if you think you can make an exception in your own case!" How do we resolve this dispute, given that the argument itself does not spell out precisely what the position of the Catholic church is on the subject of abortion?

Realistically speaking, it would seem that we can't claim to know what the position at issue quite precisely is, from our point of view as evaluators of this ad hominem criticism. We cannot realistically presume that we can't at all deal with the criticism unless we are first equipped to give definitive answers on Catholic casuistic queries in moral theology. Moreover, it would seem that in some, perhaps very restricted circumstances, abortions could be ruled permissible by Catholic moral teachings. But exposing the fuller structure of the "official" Catholic position on this issue would be a further undertaking.

Thus the position of the arguers is really that both have some idea of what the Catholic position is. Both know and agree that the Catholic position is a stand against abortion. But what that stand comes down to, in specific instances where exceptions may or may not be permissible, is not known. Specific commitments of the position are at best a matter of plausibility or conjecture, perhaps best resolved or clarified by further argument and dialectic.

Whether the criticism of inconsistency is fairly justifiable depends, moreover, on what the position is of the person allegedly considering abortion. This defender of a position, let us call her Smith, must try to defend her position as a Catholic, depending on how she interprets the Catholic teachings on this matter as it affects her case. It could even be, for example, that the Catholic position is currently being discussed and modified by the church, that it is currently open to dispute in respect to certain types of cases. What matters then is Smith's position as she takes herself to be a practising Catholic. Can she defend her position against this criticism or not?

Realistically speaking, Smith may not know very clearly what her own position is. Perhaps she hadn't really thought very deeply about her commitments as a Catholic on this issue and what these implied, given the shock of her recent discovery about the birth defect. True, there are a definite set of statements in official church pronouncements that help to define the Catholic position, but she only has a very general idea of what these are. She knows that Catholic theology is against killing and for the flourishing of life. She knows that there may be no obligation to insist on the preservation of life in certain circumstances however, if such an

insistence may constitute a grave burden of suffering in hopeless circumstances. But in relation to her own specific circumstances and that of her baby, Smith is not able to more fully spell out the Catholic position, or how it should best be interpreted.

And if you think of it, that is most often the situation in all the ad hominem criticisms we have previously studied. The arguer knows some of his opponent's commitments quite definitely, but the opponent's fuller position on the issue may not be known, and may only begin to emerge as the argument unfolds. Moreover, one's own position may be clear in some respects, but extremely murky on others. One finds oneself hotly defending commitments that, before the argument, one did not think important or even realized one had. In fact most arguments are curiously revealing and informative precisely by virtue of more sharply articulating one's dimly held commitments.[5]

In the present case, it may be that Smith has many commitments as a practising Catholic and as a thoughtful and concerned person on the subject of abortion and the preservation of life. No doubt, her critic also has many deeply held commitments relevant to this issue as well. But neither may know precisely what these commitments are until their tenability is tested by argument.

The issue to resolve the ad hominem dispute is not

precisely: what is the position of the Catholic church on abortion? It is: what is Smith's position? Of course, Smith has joined her position with that of the Catholic church. That is the stance she takes. But the question is more one of Smith's internal consistency of position, given what the parties to the dispute take that position to be in light of their agreement that it is a Catholic position. Indeed, given the realities of theological and casuistic doctrinal knowledge on specific cases, the Catholic position in Smith's case may not be one to admit of a tightly defined characterization. It may, in a phrase, be open to dispute.

Part of the benefit of Smith's engaging in argument on the topic may be her development of a more sophisticated and balanced ethical position on abortion. Her Catholicism may be refined and deepened through argument, with new understanding and insight. Despite the pitfalls of ad hominem argumentation--all the numerous ways it can go wrong--it may sometimes have positive value if the dialogue in which it occurs is well-managed.

The fact about the practice of argumentation in the marketplace of disputation is that one's position on an issue is rarely if ever completely articulated and pinned down as well as it could be. The process of dialogue then can be valuable if it takes statements from the dark side

and brings them into the light side of an arguer's position. One's position can be expanded and deepened on a topic of dispute.

5.5 New Perspectives on Circularity

We saw in 4.6 that begging the question and arguing in a circle are not "fallacies" in the sense of being violations of any locution-rule, dialogue-rule, or commitment-rule of the game. Nor are these patterns of argument in dialogue strictly violations of any strategic rule of CB, or any of its extensions studied so far. In fact, as we saw in our discussion in 4.7, both of these patterns are really violations of principles of one's own strategy that one may adopt in playing a game of dialogue. Clearly seen, they are not unfair moves in dialogue against one's adversary, but are strategic blunders against one's own case, something like being hoist by one's own petard in attacking a position.

Arguing in a circle involves using one of your opponent's commitments A to get him to accept a proposition B, by series of steps of argument, and subsequently using what is now one of his commitments, B, to prove something that doesn't now need proving, namely A. It doesn't need proving because your opponent has already included it in

his commitments in the first place. That doesn't mean it had to be "wrong" for you to use such a circular route of proof. It might be an effective distancing strategy, or part of one. But if your strategy involves a movement of proof from the more plausible to the less plausible according to strategy principle (C1), then circular argument can be a defective type of strategy in that context of dialogue.

Begging the question is similarly harmless, and seems equally silly as a strategic sequence of play in dialogue. If my thesis to be proved is T, then since the game is a disputation, you will not be strategically inclined to accept T, or any statement that directly implies T. Therefore if I ask you to accept T as a commitment, or some statement that directly implies T by a rule of the game, you are hardly likely to acquiesce. Assuming you are even moderately experienced or knowledgeable in playing the game, my moves will almost certainly be wasted in such an obtuse ploy.

We concluded then, somewhat paradoxically--or at any rate, in violation of longstanding tradition--that neither arguing in a circle nor begging the question are fallacies. At least they are not fallacious in the games we have investigated so far, if by "fallacy" you mean a violation of a rule of the game. They may sometimes be

fallacies if you allow as "fallacy" a sequence of moves that turned out to be bad strategy as part of your play meant to win the game.

Moreover, there are some interesting exceptions to the generalization that arguing in a circle is bad strategy, in addition to the exception noted three paragraphs above. One of these other exceptions was brought out in 4.8, in the dialogue between Blanche and Pierre. Blanche argued in a circle, and Pierre was justified in criticizing her argument for that reason. Clearly, Blanche as a foundationalist, was operating on principle (C1) in building her case. But Blanche replied to the criticism quite effectively. When we saw the fuller contours of her argument, we could accept the circle between P and M once she brought in the more complex linkages among P, C, and M. By so expanding her argument she "broke out of the circle". True, C and P were linked by a circle, but Blanche acknowledged Pierre's justified criticism of that argument. She then changed her argument, or at least expanded it, thereby changing it, and showed how P could be based on C without always needing to bring in M with its circular relationship to P.

In this instance, we saw that the allegation of circular argument can be a justifiable criticism--essentially because (C1) was the appropriate strategic context.

Yet we saw that this kind of criticism can be responded to without the replier's argument being refuted, at least totally. Blanche's first argument was "refuted", in the sense of being shown strategically inappropriate by Pierre. But she then changed, or perhaps expanded her argument, thereby accommodating the criticism. Here then is a partial exception to the generalization that arguing in a circle is unqualifiably bad strategy. Perhaps we should say that it can be somewhat bad, yet "fixed up" in response to criticism. One suggestion here might be that just as in CBV (CBZ) an answerer (questioner) should straighten out his (opponent's) direct inconsistencies and ambivalences of position, so in other possible extensions of these games immediate circles should be sorted out by one player or the other.

Another interesting exception to the generalization that circular argument is bad strategy is brought out by the Woods-Walton fragment of (H) in 2.2. Suppose Black has used B as a premiss to get White to accept A, but then White withdraws B. Would it be legitimate for Black to then use A to get White to accept B? Yes, it would. Nor would it be strategically bad for Black to so argue. After all, B is no longer a commitment of White's, but A now is. So Black's circular strategy is perfectly sound. Of course now White accepts B, he cannot with strategic

wisdom circularly argue 'B, B ⊃ A'. That would be a wasted move, assuming White has not in the meantime withdrawn A, just as he withdrew B before.

Hence we can now see that the apparent need to block circular dialogue-fragments, like the Woods-Walton one, has turned out to be unnecessary. No rule of the game need block them. They are sometimes bad strategy, but not always. When they can be justifiably criticized as bad strategy, the criticism can be met by further moves--either by retracting certain steps of the argument, or in some instances by adding more steps and changing the argument.

There is also the simpler kind of circle-game, mentioned in 2.2, where a participant uses A as a premiss to prove A to his opponent. This form of circular argument by itself suffers from a strategic defect in CB. For if A is a commitment of the opponent's, proving it to him as conclusion is redundant. If A is not yet one of his commitments, using it as a premiss is futile, if your object is to get him to accept it as the conclusion. Since A must be a commitment of your opponent's or not, arguing 'A, therefore A' is always bad strategy.

More and more evidence mounts then, from the viewpoint on games of dialogue we have adopted, that circular arguments are not fallacious, that when they are wrong it

is only because they fall short of optimal strategy for an arguer in building up his own case. This conclusion is a hard one for some to swallow, however. Some orderly souls are committed to the view that scientific progress is a cumulative building on axiomatic foundations. For these theorists, "looping around" should never be tolerated in real proof, if proof is a route to truth. For their sake, let's have another stab at trying to see what else could be wrong with circles in proofs.

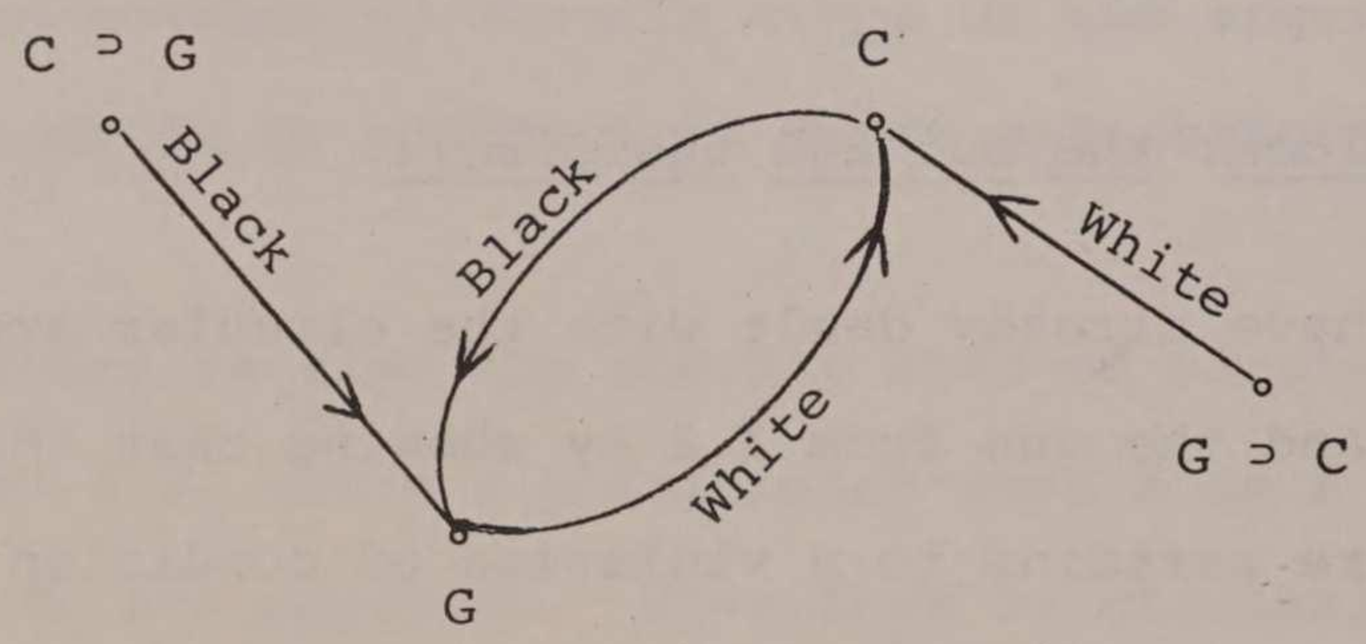
5.6 The Clock, the Gun and the Circle

We have already dealt with the circular argument of the clock and the gun from 1.2 by showing that the circularity there pertains to a violation of condition (C1) of plausibility-ordering in strategy. Yet this argument remains our most deeply worrisome case of circularity, and deserves further analysis and commentary.

We can see the circle involved in the clock and gun argument by looking at the sequence of questions and answers it represents. Let C stand for White's contention 'My clock gives the correct time' and G stand for Black's contention 'The firing of my gun indicates the correct time.'

	WHITE	BLACK
1.	Statement C	Statement G
2.	Why G?	Why C?
3.	C, C ⊃ G	G, G ⊃ C

This dialogue does take the form of a circle-game, but only if we take the innovative approach of combining both columns in a single graph, as below.



But why should we combine both arguments and consider the whole "one" argument? Whose argument is it? Who commits the fallacy? For surely each argument, taken separately, is circle-free.

Another puzzling question: what if one or the other were basing his time-keeping on some means of information independent of the other's, like radio time-signals? Could there still be a vicious circle involved? If White sets his clock by the radio and Black knows it, it is not fallacious

for Black to time his gun by White's clock. But it would be poor judgement for White to start basing his clock-setting on the gun, once he has the more reliable source of information, the radio. Yet injudicious choice of available sources of evidence need not be a petitio principii fallacy in one's argument.

If you look at either Black's or White's argument individually, apart from the other, you could be justified in saying that there is nothing inherently fallacious about it, in itself. Take White's argument that his clock is right because it is set by the firing of Black's gun. Such a method of setting one's clock is of course inherently relative and subjective as a way of knowing or proving something. It depends on how accurate Black's timekeeping is. It is like an appeal to testimony or expertise. All such appeals are essentially subjective in that they presuppose that the witness or the expert has based his sayso on some objective evidence. That does not mean, however, that all such subjective appeals are inherently fallacious. But they can certainly become fallacious if it is determined that underlying evidence is lacking.

If White has no better way of checking the time, and has no reason to believe that Black's timekeeping is not based on independent evidence, there may be no good justification for criticizing his reliance on Black as

inherently fallacious. Perhaps where White could be criticized is for laziness though. Instead of sanguinely assuming Black is basing his timekeeping on a reliable source like radio reports based on scientific timekeeping, he should take the initiative to consult the radio himself occasionally to check this assumption. Since presumably, in the case in question, it would not be difficult for White to check the radio time signals from time to time, it is perhaps reasonable to say that his failure to do this can be criticized as a failure to seek out additional evidence of a more reliable sort. The "fallacy" here might be Black's uncritical reliance on a not very reliable subjective source when a better one--the equally subjective but more reliable testimony of a radio announcer--is easily available.

But reliance on an imperfect source of verification of an assumption need not always be fallacious. For sometimes a subjective source of testimony may be the best information one has to go on. It seems then that the deeper fallacy of Black's and White's mutual reliance on each other comes out when we consider their two arguments jointly as interdependent on each other. This mutual dependence is the "circle". It is a case of the blind leading the blind. But we still haven't explained what is fallacious in such joint enterprises.

Notice however that if the ostensibly fallacious circle is a joint enterprise, it is not simply a case of a "fallacy" in the sense of one arguer unilaterally using an incorrect or unfair argument to defeat or mislead the other in disputation. Somehow each of them collaborates with the other to jointly commit a "fallacy" against himself, if that makes sense. Each fools himself by thinking of the other's evidence as "better" than it really is. Thus it is not truly accurate or correct to say that Black commits a fallacy against White or vice-versa. Hence there is justification for saying that this case is--like the other examples of circular argument we have studied--not a "fallacy" in the strict sense of a violation of a rule of a game of dialogue. It seems rather more like a strategic failure in the arguer's attempt to build his own case. It is more a failure against oneself than a foul play against one's opponent in argument.

No matter how we try to wiggle out of it, we seemed to be driven towards the conclusion that there is no fallacy of arguing in a circle or question-begging in the clock and gun argument. This seemingly absurd conclusion is, curiously enough, confirmed by the finding that, as far as the rules of CB and its extensions go, there is nothing illegal about the dialogue-sequence between Black and White. The objective of CB and its extensions is to

take a commitment of your adversary's and show that your own contention follows from it. And that is exactly what both Black and White do in their dialogue above.

If each of them is committed to his own method of time determination, then they are in fact <u>proving to each other</u> in precisely the way demanded by CB. In this sense, their respective strategies are quite sound from the point of view of all the games of dialogue constructed so far. Yet the problem remains for us that in the case of each arguer, his commitment to the method of the other turns out somehow to be unjustifiable.

Each successfully proves the following: on your assumption, my conclusion is correct. Therefore each adopts perfectly sound strategy in CB. Yet taken as a whole, the dialogue is absurd because each only <u>presumes</u> the reliability of the other's method of time-keeping.

Perhaps then, what each is doing in relation to the objectives and standards of CB-games is quite acceptable, but where they fall down is that they ought to be striving to do something more. If what each of them is doing can be correctly described as proving that "my criterion of time-accuracy is every bit as good as yours", then each succeeds in proving precisely that to his partner in dialogue. Well and good, but the feeling remains that what they should be doing is something more than this

relativistic form of proving. It's what they don't do that seems fallacious then. Each should probe more deeply into the basis of the other's commitments.

The suggestion is that the conclusion to be proven should not merely be: my system is right by your assumptions. The question should be: are your assumptions justifiable by appeal to some better known set of assumptions? This suggestion could pose a criticism of CB-dialogues as a whole system: the "truth" proven is only relative to what the other assumes or grants.

5.7 Semantics versus Pragmatics

The criticism voiced in the last section is that logical games of dialogue don't really prove anything except what they assume. According to this criticism, games of dialogue themselves embody a petitio principii fallacy in their very structure, and that's why circular reasoning is not ruled as fallacious within this structure. All the players are doing is trying to prove contestively to the other by extracting their own contentions from the commitments of the other. But because these games are disputes, the participants need not share "reasonable" commitments and hence the play they engage in doesn't really prove anything at all. What they should really be doing if they were serious, is to pool their best common

commitments and see what they could prove from that stock of agreed premisses by logical rules of inference. Otherwise, the game doesn't really prove anything or go anywhere. So goes the objection.

This is a common criticism of dialectic, and indeed philosophical argumentation generally. It seems to go in a big circle, starting from what we already knew and coming back to the same point. It doesn't seem to "prove" anything, or at least anything "new".

There is one way in which we should concede that this criticism is accurate. The participants in the CB-games "prove" only to the other by means of premisses obtained as concessions from the other. They don't "prove" from some set of facts or evidential statements that they must accept as obtaining independently of their own individual commitment-stores. Proof is only "by concession" and not "absolute".

This relative notion of proof by dialectic would not satisfy positivist philosophers of science who want all scientific arguments to be ultimately based on empirical findings independent of the finders. They would see dialectic to be hopelessly circular as a way of finding the truth. Others disagree however, and have seen the dialectical exposure of fallacies and errors as itself a revealing and scientifically respectable form of argument.

A foremost exponent of this view is Sir Karl Popper, who wrote in Conjectures and Refutations:

> . . . although the world of appearances is indeed a world of mere shadows on the walls of our cave, we all constantly reach out beyond it; and although, as Democritus said, the truth is hidden in the deep, we can probe into the deep. There is no criterion of truth at our disposal, and this fact supports pessimism. But we do possess criteria which, if we are lucky, may allow us to recognize error and falsity. Clarity and distinctness are not criteria of truth, but such things as obscurity or confusion may indicate error. Similarly coherence cannot establish truth, but incoherence and inconsistency do establish falsehood. And, when they are recognized, our own errors provide the dim red lights which help us in groping our way out of the darkness of our cave.[5]

From this perspective, dialectic is a route to the truth because it enables us to reject falsehoods when we see that our previous commitment to them was based on faulty or inadequate reasoning. According to Popper, this negative route to the truth is the only one we have. By Popper's account, inadequate hypotheses can be conclusively refuted, but acceptable ones can never be conclusively confirmed and are always open to criticism if they are genuine scientific hypotheses. So dialectic is the best we have. Proof is always a relative matter, by its very nature.

Three points should be made for dialectic, as we

have conceived it. First, in CBV and its extensions, proof may be a relative matter, and therefore dialectical argument may often seem circular. But such circularity can be defended against the charge of triviality or fallaciousness by the observation that dialectic can lead to new knowledge. A participant in dialogue articulates and brings to the light side his previous darkly held and inarticulate commitments. In so doing, he begins to see why he held the position he dogmatically accepted beforehand. Having uncovered the arguments for and against his commitments, he will reaffirm some and reject others, thus refining his position and deepening his commitments in the truest sense. His commitments may change or they may not. But the important thing is that by defending them against his adversary's criticisms, he will learn whether they are reasonable or not as propositions worth maintaining in argument. The circular staircase of dialectic can be an ascent out of the cave of fallacy, from the darkness towards the light.

The second point is that although axiom systems in mathematics are ordered so that the not-yet-proven may not yet be assumed, this ordering may be a matter of the heuristics or presentation of a theory. It may be a matter of what we have called 'strategy' in games of dialogue, rather than being a procedural rule of the game

itself. Axiomatic presentation of a theory, consideration of whether one prefers to present one's axiomatization of a theory to another equivalent axiomatization, can be thought of as a matter of one's strategy in presenting the theory. Hence the axiomatic presentation of a theory, like the foundationalist philosopher's insistence on going exclusively from the better known to the less well known propositions in argument, may be only one type of strategy in dialogue. It may not represent the ideal, the only way that really good dialogue should proceed.

The third point brings us back to the disputed demarcations between semantics and pragmatics. I have argued in 4.9 that semantics is included in pragmatics, or perhaps better, presupposed by pragmatics. In logical dialogue-games classical logic (with certain tolerable variants), is the basic logic of dialogue, and provides its semantic structure. But the need to cope with the fallacies requires that we flesh out this semantic structure with its pragmatic implementations.

The games of dialogue, CB and its many variants, provide the needed pragmatic apparatus. And I have argued that pragmatic notions, like asserting and questioning, can be defined in games of dialogue that already have a core semantic structure. CBV and its newer variants of

this chapter offer new resources for more ways of defining the basic pragmatic notions.

Hence it is only reasonable to think that games of dialogue yield relativized notions of truth and proof. Indeed, the only reasons they yield these notions at all stem from their containment of semantics. But semantics itself yields only relative notions of truth and proof--what is 'true' or 'proven' is always relative to certain assumptions, as Tarski has shown us. Pragmatics goes further, as our excursions into the fallacies have shown. But pragmatics is limited by the fact that its criticisms and refutations are only justifiable as non-fallacious relative to the commitments of the disputants in the game of dialogue being played.

There is indeed a sort of curvature or circularity in this enterprise, just as there is in semantics itself. It is not a harmful or fallacious circularity, but more like two lost speluncar explorers leading each other, by halting steps and gropings, out of the darkness of a cave under the earth. But they cannot see the light clearly enough to negotiate the climb each on his own. Each can assist the other to avoid the crevices and slippery places, and get a little further along. Even so, there is a certain competitiveness between them, and they make

bets along the way on who can be the first to make his way over a tricky bit of terrain.

Notes: Chapter Five

[1]See 1.3.

[2]In a meeting of the Logic Seminar at Victoria University of Wellington (New Zealand) in March, 1983, when the author gave a talk on logical games of dialogue.

[3]There may be variations where α can see β's slate but not conversely, or where α can see his own slate but not β's slate, and so forth. We do not explore these variants here.

[4]Normally we have been thinking of these games as not allowing communications between the players other than the moves permitted by the rules of the game. That means there are no coalitions or agreements struck outside the normal sequences of play as governed by the rules. In particular therefore, agreements to "trade off" commitments or bargain over retractions are not allowed as affecting in any way strategy or outcome of the game. That does not mean however that we couldn't have extensions of the games we have considered where certain moves could be designed to permit a player this sort of locution: "Will you agree to move in such-and-such a way on your next move if I move in such-and-such way on my next move?" Perhaps penalties could be agreed on by the players for failure to honor such agreements. For the present, this type of extension of our games would seem best barred. It could bring in various complications of strategy that I prefer not to consider in relation to the present study of the fallacies.

[5]K. R. Popper, Conjectures and Refutations, London, Routledge and Kegan Paul (3rd ed.), 1969, p. 28.

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