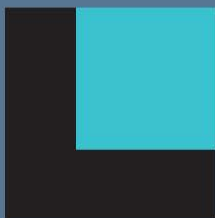
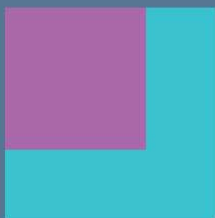
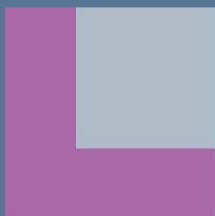
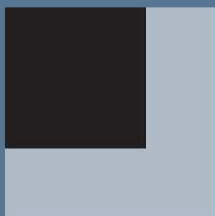


# Consciousness and Object

Riccardo Manzotti

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## **Volume 95**

Consciousness and Object. A mind-object identity physicalist theory  
by Riccardo Manzotti

# Consciousness and Object

A mind-object identity physicalist theory

Riccardo Manzotti

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## Foreword

*The invention of alternatives to the view at the centre of discussion constitutes an essential part of the empirical method.*  
(Paul Feyerabend)

This book is a reboot of the mind-body problem – what is consciousness? How does it connect with the world? Actually, it is a reboot in terms of mind-object identity. Its main goal is to offer a fresh start that will challenge and upturn the standard approach that – following David Armstrong's, Thomas Nagel's, and David Chalmers' work – has taken over the debate in philosophy of mind and, to a large extent, neuroscience. By and large, the received view is that consciousness is a physical phenomenon that cannot be observed by traditional means and that will require some exceptional psycho-physical law to be properly understood. Such a zeitgeist reveals an underlying anti-Copernican attitude – subjects are special and require special rules. As Spinoza stated, they are supposed to be a special domain inside a larger domain. In contrast, this book will try to explain consciousness without stepping outside of existing and known natural laws, i.e., a pure Copernican attitude. No emergence, dual aspect of information, additional layers or ontological allowances of any kind will be invoked. Consciousness must fit inside the existing physical world as we know it.

Henceforth I will use the terms consciousness, phenomenal experience, experience, conscious experience, and conscious mind as synonyms. Other scholars have pointed out the practical overlapping of such terms. For one, Galen Strawson reckoned that consciousness is “the phenomenon whose existence is more certain than the existence of anything else: experience, ‘consciousness’, conscious experience, ‘phenomenology’, experiential ‘what-it’s-likeness’, feeling, sensation, explicit conscious thought [...] Many words are used to denote this necessarily occurrent phenomenon” (Strawson 2006,3). In this regard, Chalmers himself stated that “The really hard problem of consciousness is the problem of experience” (Chalmers 1995,202) and that “‘consciousness’ and ‘experience’ are the most straightforward terms” (Chalmers 1996,6).

The book calls into question the gap between phenomenal and physical properties. Phenomenal and physical properties, surprisingly, might turn out to be the same. Their alleged difference, I will argue, is neither an empirical fact nor a self-evident truth. Rather it is the consequence of the way in which the mind-body problem has been addressed. The alleged metaphysical chasm is the offshoot of a wrong premise, namely that our experience is distinct from the object we experience or,



similarly, that we are different and separate from the nature we thrive in. Such a premise, in turn, is the result of a belief that has all too often driven philosophical speculation – namely that we are somehow special with respect to the rest of the universe. We are not and there's no reason why we should be.

By and large, the belief in the separation between subject and objects is based on two further premises – one of allegedly empirical nature and another one stemming from an arbitrary hypothesis. The former is the belief in the possibility of genuine pristine mental content of the kind allegedly experienced in the case of such hallucinations and illusions. Something I will attempt to address and debunk such alleged empirical evidence. The latter is the notion that we are located inside our bodies, which is another belief that has no real empirical ground and that will be the main point on contention during this book.

Very suspiciously, the notion that the mind is different from the physical world has always been all too reassuring. Likely, It stemmed from the very human desire of being special. In turn, the belief in the uniqueness of the mind spawned the cognate belief in the uniqueness of the brain, which is commonly believed to host unique powers, even in the most scientific circles an updated version of Pascal's thinking reed. Due to yet-to-be-ascertained circumstances, the brain is routinely deemed to be unique. And yet, the brain is just a chunk of cells. There are no known reasons why the brain should require any more ontological allowance than, say, the liver or the lungs. The brain does what it does, just like all other organs, they do what they do – they all abide by the same natural principles, and no allowances should be asked for.

All too often, attempts to find consciousness inside the nervous system have one thing in common: they suggest that man is unlike nature. We desire a gap between us and the world. We want to be kept separate from the brute and decaying matter. It is not by chance that the word 'distinction' means both separation and superiority.

By and large, such attempts are anti-Copernican insofar as they try to explain the mind, and thus consciousness, by means of a special principle. Anti-Copernican approaches are suspicious because they explain human affairs by appealing to special *ad hoc* principles that are opaque to any future explanation: they are the hallmark of a deep misunderstanding about what is under scrutiny. Eventually, notions such as the *Earth had a special place in the universe, human beings had a special place in the animal kingdom, that human history had a special place in time, and that life had a special nature*, proved to be parochial delusions. Mind must find a place in nature, and the distinction between subjects and objects is the last Copernican stanced.

In contrast, here I adopt a bold Copernican attitude – all aspects of consciousness must fit in the physical domain, since they are no more special than,

say, pebbles, raindrops, lungs, and light rays. Coherently, my approach is utterly physicalist.

In the last 50 years, in philosophy of perception, the debate between direct and indirect perception has raged as hot as ever. The obstacles offered by the multifaceted argument from misperception (illusions, hallucinations, dreams, perceptual error) and the computational view of the mind have encouraged many scholars to embrace the apparently easiest solution: indirect perception. Experience is the upshot of an internal world of appearances concocted by the neural machinery (likely of a computational nature). Unfortunately, such sirens, as beautiful as they may seem, have often lured scholars to shipwreck on the rocks formed by emergent properties, the dual aspect of reality, epiphenomenalism, and Cartesian materialism. As a result, the debate has seen various attempts to pull away from such attractive but, as many have personally experienced, disastrous routes. On the one hand, philosophers of analytical background have developed various forms of direct realism, relationalism, and disjunctivism (Martin 2004; Byrne and Logue 2009; Cohen 2009; Brewer 2011; Smith 2002). On the other hand, various philosophers have considered the possibility of stretching the physical basis of the mind out of the brain. This is characterized by rejection of the idea that the brain is the organ that secretes conscious experience. I call them externalists for lack of a better name. Externalists can be grouped according to the following categories: classic content externalists (Putnam 1975; Burge 1979; Burge 2003; Farkas 2003; Hurley 2010), enactivism or active externalism (O'Regan and Noë 2001b; O'Regan 2011; Noë 2004; Noë 2009; Stewart et al. 2010; Hutto and Myin 2016; Hurley 2010), radical embodiment (Chemero 2009; Shanahan 2010; Rockwell 2005; R. A. Wilson 2004; Hurley 2010), life and environment (Thompson and Varela 2001; Varela, Thompson, and Rosh 1991; Thompson 2007), information (Dretske 1996), and the extended mind (Clark and Chalmers 1998; Clark 2008). Such views, as I have said, share the common feeling that the brain is not enough and that the active engagement of one's body with the world is not only causally relevant but, in some yet-to-be-clarified sense, *constitutive* of one's mental life.

Yet, all such attempts have been unable to propose a convincing alternative to the prevailing – at least in neuroscience – brain-centric view of the mind. The fact is that body-world interactions – alluring as they are as an alternative to neural processes – still fall short of providing something akin to our experience. Since Gibson's affordances, it has been difficult to convince people that our experience of, say, red is nothing but the movement of the eyes in response to certain surface color reflectances. Admittedly, neural processes do not fare any better, but are at least hidden. Are they not supposed to have some tricks, or host some unexpected *deus ex machina* (dual aspect, information integration, emergent properties) that will sooner or later come to the rescue? So far, radical embodiment, active

externalism, the extended mind, and enactivism have not been particularly convincing as regards consciousness and have, to a large extent, withdrawn to the safer realm of cognition (Chalmers 2008; Clark 2008; Stewart et al. 2010; Krueger 2010; Kirchhoff 2012; Steiner 2014; Hutto and Myin 2016).

It might be the case, though, that their original inspiration was correct – the brain is not the place to look for it. Yet, neither are body–world interactions. The solution might lie ahead, just a bit further off, like Scott’s lost base camp. In such a spirit, here I put forward a radical alternative: namely that consciousness is identical with *external objects*. In short, the hypothesis is that: *when I perceive a red apple, the thing that is one and the same with my consciousness of the red apple is the very red apple one can grab and eat*, rather than the neural processes triggered by the red apple – experience is physical rather than neural. The bottom line is that *one’s experience of an object is the object one experiences*.

However, neural activity is not dismissed. The brain and the body have a causal role rather than a constitutive one. One’s body – sensorimotor apparatus and nervous system combined – plays a contingent causal role as, say, a dam plays a contingent causal role in the creation of a lake. The dam, though, is not the lake. The dam is made of concrete and bricks while the lake is made of water. Of course, I adopt a naïve ontological stance as to the identity of the lake here – the point is not to pinpoint the nature of the lake (as opposed to the water it is made of), but to stress the difference between the lake and the dam, whatever they are. The lake and the dam occupy different spatial locations. They are numerically different. Yet, in practice, if the dam is destroyed, the lake will disappear. *Ceteris paribus*, the dam brings the lake into existence.

The body brings the external object into existence because it provides the proper circumstances for the object to cause effects. I am not worried by considerations of causal nature such as whether the body is sufficient for the object to occur and thus to exist. It is enough, for the present discussion, to reckon that, in such circumstances, without the body, the object one perceives would not exist. The body, though, is not the object. The object is the thing we call mind. This conceptual twist explains how the mind reaches the external object – the mind does not reach it, it is the external object. Thus the mind is out of the body, but crucially the mind is not immaterial but physical, it *is* the external relative object. Thus mind is in the world, because it is made of the world. In this way, the body – i.e., the brain – does not need any special, mysterious power. The brain does what it does, and the mind is what it is: an object in the world. The subject is just an object among other objects.

Without chagrin, I must admit that this book defends a form of eliminativism. The proposed approach states that experience is nothing but a subset of the world we live in. Thus, the notion of subjects and minds, as something over and above

the physical world, is set aside. Subjects do exist – they are the objects. Yet, there is a catch, I suggest to revisit the standard notion of object in terms of actual relative objects. Phenomenal character, subjective experience, perceptions, internal representations, mental images, impressions, and ideas are exposed as many conceptual crutches used to safeguard the premise that the subject and the object are separate and that objects have absolute properties, a view that will be labeled *naïve materialism*. In fact, if subject and object were separate, one should assume that inside the subject there is something that stands for the object without being the object i.e., intentionality or representationalism. A classic example of such a ghost deputizing for the object is the traditional notion of phenomenal experience, which is nothing but a doppelgänger of the external world. Phenomenal character and intentionality are only conceptual inventions. I start my work by questioning such premises – is the subject just an object?

Historically, the notion of the mind as something different and separate from nature has been a flattering offshoot of the separation between subject and object. Contemporary attempts to naturalize the mind have failed because they moved from the wrong material candidate – the body – rather than from the correct one – the object. They were obliged to do so, among the other reasons, because they accepted an over simplistic notion of object.

In this book, first I will emphasize the key explanatory function of identity theories. Second, I will outline the main hypothesis and the relation between mind, body, and object. I will then address, albeit in a sketchy way, a series of obstacles to such a view – ontological assumptions and misperception (hallucinations and illusions). Finally, I will put forward a few key notions: the *actual and relative object*, the *identity between experience and the object*, and the *spatiotemporal structure of the object* that is one's experience. Along the way, I will set aside traditional notions such as the chasm between subjective and objective properties, the notion of intentionality, the alleged peculiarity of subjective experience, the notion of the punctual present, and the belief in an absolute ideal object (naïve materialism). The view I will outline supports direct realism but goes further, revisiting both the notion of experience and that of object.



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## CHAPTER 1

# A materialist theory of the mind

*In the interest of science, it is necessary over and over again to engage in the critique of these fundamental concepts, in order that we may not unconsciously be ruled by them. This becomes evident especially in those situations involving development of ideas in which the consistent use of the traditional fundamental concepts leads us to paradoxes difficult to resolve.*

(Albert Einstein)

In 1968, David Armstrong began his seminal book by asking ‘what is a man?’ His prompt reply was that “he is a certain sort of material object” (Armstrong 1968, 12). Yet, one may ask further, which material object? We know that Armstrong and many other scholars had in mind the human body, in particular the central nervous system or the brain (Smart 1959; Place 1956; Koch 2004; Tononi 2004; Crick 1994; Zeki 2003). In the 16th century, the notion that the mind is secreted by the brain, as bile is secreted by the spleen, spread like wildfire and became quickly one of the most deeply entrenched assumptions in philosophy, science, and common sense (Searle 1992). In fact, a popular belief is that our mind, and thus we, are located where our bodies are. If hard-pressed to be more precise, many would point to their heads. Give or take, I feel to be roughly behind my eyes and between my ears, a bit over my inner tongue, and not far from my mouth. Yet, such a feeling and the ensuing notions – no matter how entrenched they are in our culture – might be wrong, deadly wrong.

This book starts with Armstrong’s premise – that consciousness is physical – but then proceeds along a radically different path. The material object that is consciousness is no longer the human body, but rather the external object – i.e., the physical object that takes place because of the causal possibilities offered by the body. The view presented here endorses a materialistic theory of the mind. Moreover, it addresses Nagel’s traditional question of “what it is like to be something.” By and large, my reply will be that the world clamors to be recognized as the stuff our experience is made of.

My bet is that such a shift in perspective will not contradict any known empirical law. Moreover, the proposed view goes further than other attempts to take into consideration the dependence between one’s experience and the external



world – e.g., various stripes of externalism, enactivism, models of extended cognition, and radical embodiment (Clark and Chalmers 1998; Clark 2008; Rockwell 2005; Chemero 2009; Hutto and Myin 2016; Hurley 2003; Hutto 2017).

Can the mind be literally identical with the external world we are aware of? Please note that the hypothesis under scrutiny is neither a new version of panpsychism nor a declination of Russellian monism. In fact, the presented theory neither requires the addition of any phenomenal quality to the physical world nor the conversion to a neutral ontology. The physical world is supposed to be sufficient to host the thing that tradition has called consciousness aka experience. The reason why experience and the world have been kept apart – I will argue – does not lie in their incongruity, but in a series of wrong premises.

Consider a simple case. You sit in front of your kitchen table and you observe an apple. Your body and the apple are the only visible actors. So far, nothing requires any metaphysical leap. No mystery occurs. What is going on, while not easy to know in detail, is of a physical nature. The apple is physical. Light is physical. Your eyes, sensors, and nerves are physical. The neural machinery that yields the recognition of the apple is very complex, but it does not present any fundamental philosophical problem.

Then, your experience of the apple comes into the picture. What is it? What kind of thing is one's experience? Is it really something additional to what we have just considered? In fact, you experience a red, round, and applish object. I would be tempted to say that, if you are not philosophically biased, you may express your existential situation by saying that your experience is red, round and applish. Ordinarily, most neuroscientists have assumed that experience is somewhat generated inside the body, possibly inside the brain. Of course, once you assume that experience is inside the brain, experience cannot be the apple. As a result, most people presume that the experience of the apple *is not* the apple. This is begging the question. This is a problem because, to the best of our knowledge, in nature everything is just what it is. The apple is the apple. The table is the table.  $H_2O$  is  $H_2O$ . The Sun is the Sun. On the one hand, if we assumed that our experience is different from the apple, how could our experience be red, round, and applish? How can experience reach its objects? Based on such a premise, experience does something that nothing else does – namely, it reaches outside itself. Experience is asked to be two things at once.

In a nutshell, using very impressionistic strokes, let me sketch the standard view which I suspect is irredeemably wrong. Common sense suggests that we are minds either concocted by our brains or emerging out of body–world interaction. Commonly, our minds are taken to be located roughly *here* where our bodies are, while the world is *there*. Because of various processes, usually of computational nature, brains develop representations of the distant (and separate) world, whose meaning is grasped thanks to unfathomable relations – such as intentionality –

whose ontology seems utterly incompatible with the rest of the physical world. In one popular version of this view, bodies swallow information and brains process it in order to eventually concoct the right mental images of the world over internal mental screens (Marr 1982). In another version, the brain secretes internal mental juices that are invisible to everyone but their owner, somewhat like the emperor's new clothes (Tononi 2004; Koch 2004; Tegmark 2014). Conveniently yet suspiciously, mental properties are routinely taken to be somewhere different from anything else in nature. Finally, in yet another version, brain, body, and world are engaged in a continuous waltz and one's experience is the waltz, irrespective of whether the waltz has any of their properties (Noë 2004; Clark and Chalmers 1998; Thompson 2007; Varela, Thompson, and Rosh 1991).

Yet ... let's reconsider the whole issue. If your experience were the neural activity inside your brain, how could it partake of the properties of the apple? Your neural activity is anything but red, round, and applish. The failure to find anything that resembles one's experience inside our bodies has led many thinkers either to place experience outside the physical world or to seek some miraculous emergent property. I will argue that both strategies are doomed to failure and that a straightforward alternative solution is available – namely that *one's experience of an object is the object one experiences*. Such a hypothesis will unfold in the mind-object identity theory.

Consider again the suggested scenario – the everyday perception of an apple. In such circumstances, as regards our enquiry, there are two physical entities – the apple and your body. Which of them is closer to your experience of the apple? Which of them shares most properties with your experience of the apple? The obvious answer is ... the apple! In fact, is the apple any worse than your body? Both the apple and your brain are physical. Both are present and available. Yet, one of them – the apple – is very much like your experience of the apple, while the other – the neural activity inside your body – is totally different. Therefore, why should the apple *not* be your experience?

In this book, I will focus mostly on perceptual experience. This does not mean that the approach I will defend cannot be extended to non-perceptual experiences, such as thoughts, emotions and the experience of adding and multiplying numbers. However, it will be my contention that experience is first and foremost a form of perception. If a satisfactory model of everyday perception is available, all other cases of experience will be explained accordingly. In the following, I will address illusions, dreams, and hallucinations as particular cases of perception.

The conceptual leap I ask the reader to consider is the possibility that our experience of the world is nothing but the world we experience. Why should it not be? After all, I am putting forward a *physicalist identity theory of the mind* – a *mind-object identity theory*. I am suggesting that there is a physical

phenomenon – the external object – and that such a physical phenomenon is the thing our experience is identical to.

By and large, the proposed identity between mind and object provides a solution of several traditional problems. To begin with, there is the gap between phenomenal and physical properties. The proposed solution is that such a gap does not exist – it was the conceptual offshoot of the alleged separation between experience and world. Since scientists have been unable to find anything like the external world inside human bodies, they have suggested that consciousness must be hidden or even invisible. Suppose you are looking for something inside a box, and suppose you can't find what you are looking for. You could either look elsewhere (as the mind-object identity theory suggests) or stick to the notion that what you are looking for is indeed inside the box. To maintain your view, you might resort to a bizarre claim: namely that what you are looking for is indeed behaving differently from the rest of the physical world. It is inside the box, but nobody can see it. It is invisible and private. Wittgenstein's beetle, of course. Once again, it is like the emperor's new clothes – experience is ... *phenomenal*! It is there inside the box, but nobody can observe it directly. Such a sketch is a caricature, of course, but it is a caricature that grasps the essence of many scientific approaches to consciousness.

The suggested approach is different. The world is made of objects. Each object exists because some stuff can produce effects in a certain way. Each causal process singles out an object whose existence is relative to the effects it produces. In such an object-only physical world, everything is physical, everything is an object, everything is relative. Each object, crucially, exists only relatively to another object. Among such objects, there are particles, waves, macroscopical objects, human bodies, stars, and so forth. Each object is, at the same time, a cause and an effect. It exists because it affects other objects, and it allows further objects to exist by being affected by them. In such a world, neither additional ontological levels nor ontologically equivocal relations – like intentionality – are needed. Human bodies, which are complex objects but by no means special, bring other objects into existence. The latter are the things we call experiences. Certain objects are the thing we call minds.

In such a way, there is no need for special relations stretching out from the body towards the world – minds are already where objects are rather than where bodies are. Experiencing something is tantamount to being the thing one perceives. The traditional indexicals – *we*, *I*, *you* – do not refer to mysterious entities floating over and above a physical world. They refer to the very objects that, because of our bodies, our experience is identical to. In such a view, the ontological separation between subjects and objects evaporates – subjects are those objects we are identical to, but no metaphysical gap divides them. This view is a radical departure from previous attempts to conceptualize the relation between the body and the world.

First and foremost, to succeed, we need to revisit a key notion – what is an object? Is the traditional notion of an object complete, or does it need some revision? In fact, I will suggest a minor revision – an object is an actual and relative object, i.e., a cause of a causal process. I will argue about the causal nature of the objects we perceive and interact with. I will stress that objects that do not have actual causal efficacy are, to all intents and purposes, inconsequential and indeed immaterial to our existence and experience. Therefore, for the time being, we will ignore abstracta and transcendental objects.

I will use identity as a tool to debunk the impossible feat requested by experience – namely representing or accessing something different from what experience is taken to be. The basic idea is that there is no need to invoke *aboutness* or intentionality if the thing that is one's experience of an object is the object itself. We experience a certain world because we are the world we experience. Experience does not need to reach the apple; experience is the apple. *Mind is not about something, mind is something*. Identity will thus be presented as a solution to the issue of intentionality. Identity is not intended as a relation between different entities. At most, it fosters a relation between two different concepts that refer to the same thing. Thus, identity is invoked to amend a conceptual mistake – i.e., a redundancy in one's ontology. Identity describes the case in which two allegedly separate things are one and the same in all respects. In this regard, identity is, of course, a recipe for reduction.

The third step, which is largely a consequence of the first two, is the spatiotemporal scope of one's experience. The basic idea is that there is no fixed spatiotemporal windowing. One's experience is a spatiotemporally extended object defined by the causal processes involved with those objects one's experience is identical with. When a human body stares at an object, because of the speed limits of causal processes, there is always a temporal delay between the external object and the neural activity. Of course, an object can be as far off as it likes, both in space and in time, as long as it has the right causal connection with one's body. A straightforward and familiar example is offered by astronomical objects.

Once the proper notions of actual object, spatiotemporal scope, and identity are set, I will check whether all cases of experience can fall under the same explanatory principle – identity between mind and a physical object. I will show that the traditional cases of misperception – modes of perception, dreams, hallucinations, and illusions – can be handled by identity. By putting the aforementioned concepts together, I will put forward the notion of *actual object*, which will be able to encompass all known cases of experience – or so I will argue. The core idea is that each object is spread across both space and time.

Of course, such a view leads to an extreme form of direct realism – *every experience is a physical object*. In fact, the burden of perceptual mistakes is shifted

to the beliefs we have about our experience. One cannot misperceive, but one can have wrong beliefs about what one perceives. After all, an internalist ought to subscribe to a similar view – one's beliefs about experience are a massive delusion about what one is and perceives.

In his introduction, Armstrong summarized his view, stating that “the mind is nothing but the brain.” Yet, 50 years of neuroscientific study have yet to confirm his hunch. If anything, the accumulation of data has deepened the gap between mind and brain. Crucially, this book is in complete agreement with the first part of Armstrong's insight – “man is nothing but a material object having none but physical properties.” Yet, which material object? Armstrong proposed the body or the brain. The alternative answer, which we will consider here, is ... the external object! The present book is a defense of the identity between experience and the external object – between man and world.

## CHAPTER 2

### Naïve materialism

*The human mind, except when guided by extraordinary genius, cannot surmount the established conclusion amid which it has been reared.* (Winston Churchill)

Groucho Marx once sent a telegram to the Friars Club of Beverly Hills, to which he belonged (Marx 1959, 329). The cable read, “Please accept my resignation. I don’t care to belong to any club that will have me as a member.” The policy of Groucho’s club is akin to the attitude endorsed by many scientists and philosophers – we, as subjects of experience, are an unexpected addition to the physical world; in many ways an unwelcome addition. In fact, a popular view is that science deals with the real world while our experience is confined to a domain of subjective appearances only contingently associated with reality. Faithful to such a view, most neuroscientists take for granted that consciousness is distilled inside the brain. Yet, notwithstanding huge efforts in this direction, so far neither neuroscience nor cognitive science have succeeded in finding the physical cradle of conscious experience (Koch et al. 2016a; Tononi and Koch 2008; Tononi and Koch 2014; G. Miller 2005; Proulx 2011; Crick 1994; Koch 2004; Zeki and Bartels 1999; Zeki 2009; Adolphs 2015; Aru et al. 2012; Seth, He, and Hohwy 2015). While a widespread consensus suggests that this failure is due either to some intrinsic gap in the fabric of nature or to a lack of data, I will maintain that it is the result of wrong premises about the location of consciousness. Because of their success in other fields, such wrong premises have not been questioned enough.

Since Galileo’s time, scholars have postulated a gap between appearance and reality – a notion that spread like wildfire. This discrepancy has been momentous and has spawned further gaps. Arguably, the most famous of these gaps is the one between appearance and reality – we do not see the world as it is, but rather as it appears. Eventually and conveniently, appearances have been swept under the mental rug and relocated to a subjective domain – the mind.

To some extent, the mind is the cornerstone of the shame of science, for it seems that no natural law can explain it. No scientific model predicts consciousness out of physical phenomena. Such an unpredictability, which is akin to the policy of Groucho’s club, ought not to come as a surprise, since the physical world has been conceptualized by removing individual experience. In Shoemaker’s

wording, the mind is the dustbin of nature where ontological leftovers are thrown (Shoemaker 1990; Cook 1996). You fix all the physical facts, you get all the observations, you outline all the physical laws, and then the leftovers are a sort of unwanted guest at the end of the scientific endeavor. I hold that this view, tempting as it seems, is simply false. You do not fix the physical facts but the facts that are described by current physics. We have no *a priori* grasp about the nature of a physical fact. Physics provides a functional harness to trap, predict and locate physical phenomena, but it does not provide any quintessential insight about phenomena, experience does. As Bertrand Russell famously stated (Russell 1927, 125):

Physics is mathematical, not because we know so much about the physical world, but because we know so little: it is only its mathematical properties that we can discover.

I will move from the premise that nature is the physical world and *vice versa*. In my – perhaps simplistic – understanding, such an identity is neither analytical nor empirical. It is just a matter of synonymy. Thus, if ghosts existed and had causal commerce with the world, ghosts should be included in the physical world. This is what science does whenever a new particle is found. Here, nature and the physical world are synonymous. Nature is all there is. For the time being, I leave abstracta – numbers, universals, concepts – out of the present account.

Usually, the most benign approach consists of keeping a fixed, standard picture of nature and then painstakingly trying to fit the mind inside it. Here, a different approach will be taken. I will consider whether it is possible to avoid the fundamental premise from which most modern and contemporary discussion about the mind is derived – namely the difference between experience and object, mind and world, appearance and reality. To achieve this aim, I will suggest a causal carving of nature that does not need to place experience outside physics. Pace Groucho's club, I expect to find what I am (experience and/or mind included) inside nature. *If nature is made of objects, experience must be an object too.*

Before entering the details of the proposal, it is worth outlining the reasons why a model of nature in which experience is not contemplated has had such undisputed success. An historical reason is the tension between scientific authority and individual experience, between the community and the individual. In such a context, it is not surprising that most scientific attempts to explain conscious experience have tinkered with the notion of experience on an epistemic level by trying to downgrade first-person experience as a massive delusion. Rather than finding experience in the world, many scholars have tried to expel it from science, just like Groucho and his club. The occasional attempt to show that human beings are not only mistaken about the external world, but also deeply deceived about their

own minds, is an extreme example of this attitude. Not only is our experience about the world deemed to be unreliable, so is the experience of experience itself. It is not coincidental that science has shown such insistence to delegitimize the epistemic value of subjective experience. The very act of labeling experience as 'subjective' can be seen as an offshoot of such an attitude. Since Galileo's time, experience has been downgraded, delegitimized, degraded, debased, humiliated, isolated, expelled, disposed, and cornered. This effort to delegitimize the authority of experience saw its climatic moments with Eddington's shadowgraphic table and Freud's theory of the unconscious mind (Tauber 2010; Eddington 1929). It continues today, confusing introspection and incorrigibility (Carruthers 2011; Libet 1993; Haggard 2009; Soon et al. 2008; Haynes and Rees 2006; Rosenberg 2016) – "the introspection of current conscious experience is [...] highly untrustworthy. [...] We are both ignorant and prone to error" (Schwitzgebel 2011, 119). Yet, while there is no doubt that one may be as mistaken about one's own conscious experience as about anything else, misjudgments about experience do not endorse any epistemic/ontological gap between appearance and reality. As is well known, this attitude is the upshot of the (in)famous admiration that Galileo, the alleged founder of the scientific method, professed for those who "through sheer force of intellect have done such violence to their own senses as to prefer what reason told them over that which sensible experience plainly showed them to the contrary" (translated in Drake 1957, 122). I suspect the time is ripe to stop attacking our senses and to start listening to them.

In contrast with such an entrenched attitude, experience and world should be analyzed jointly. For one thing, the very fact of our experience should cast doubts about the soundness of the received physicalist view rather than the other way round – if the scientific view of nature does not explain experience, so much the worse for it. We should revisit the roots of science rather than trying to explain experience away. The existence of leftovers at the end of the physical description of the world is the offshoot of an overly simplistic notion of physics.

In fact, as I will argue in the next chapters, Western science and philosophy have developed and dwelled on an idealized and simplistic notion of the physical object. To match such a notion, the world we experience has been downgraded to a mere appearance and consigned to a mental domain – the realm of subjective experience or some other implicitly pejorative label. This move has left both science and philosophy with the impossible task of connecting two largely fictitious entities – the impossible-to-experience absolute object and the impossible-to-observe subject.

In the following, experience is taken to be a part of nature. What else could it be? *Everything can't help but be a part of nature* – i.e., a physical thing. Nature and experience should not be dealt with separately, let alone considered ontologically



alien to each other. If they do not fit together, the gap will indicate a mistake in one's assumptions, rather than the hallmark of a fundamental chasm in the fabric of reality. The mind is us, and our minds, whatever they are, can't but be a part of nature.

It is my contention that merging experience and world has been difficult because we have assumed to know more than we do. As Brecht's Galileo said, "One of the main reasons for the poverty of science is that it is supposed to be so rich" (Brecht 1945). Two symmetrical notions of the object and of experience – neither of which has ever fit particularly well with nature – have so far hampered the quest for consciousness. Notions such as *phenomenal experience*, *phenomenal character*, *content*, *representation*, and *modes of presentation* are not real objects of enquiry like magnetic fields, animals, neurons, and stars. We do not observe them – we postulate them. They are conceptual promissory notes that have been disguised as real entities. As a result, they have been gradually accepted as legitimate features of the scientific and philosophical landscape. Yet, such metaphors have only hindered understanding. Rather than multiplying existing concepts, the solution defended here will proceed by means of concept subtraction and simplification.

The following pages will neither add new distinctions nor build new conceptual houses of cards, but will instead discuss a set of entrenched assumptions and then put forward an empirical hypothesis about experience. Such a hypothesis is capable of empirical predictions and is thus susceptible to falsification. It will generate Popper's risky predictions.

The questions I will try to answer are as simple as possible. In nature, what is the thing that I am? What is the thing that is identical with my experience? How is it possible that my experience is about the world outside my body if my brain is an object inside my skull? How is it possible that I seem able to experience something that is (allegedly) physically distinct from my body? What is my physical, temporal, spatial, and causal extension? Where and when do I begin and end? Am I inside my body? Am I my body? What am I? Am I the object?

## 2.1 The standard view

What is a physical object? Such a simple question has no simple answer. State of the art physics offers complex models of reality that do not match with everyday experience. Since Eddington's pivotal *The Nature of the Physical World*, the discrepancy between the scientific picture of reality and our everyday world has been a cause of puzzlement. Quantum mechanics, general relativity, and string theory have not clarified the issue, which was at the core of Sellar's dichotomy between

manifest and scientific image of the world (Sellars 1962). Recently, Galen Strawson have contrasted physicalism and physics-alism (Strawson 2006):

... real physicalism can have nothing to do with physics-alism, the view – the faith – that the nature or essence of all concrete reality can in principle be fully captured in the terms of physics. Real physicalism cannot have anything to do with physics-alism unless it is supposed – obviously falsely – that the terms of physics can fully capture the nature or essence of experience. It is unfortunate that ‘physicalism’ is today standardly used to mean physics-alism because it obliges me to speak of ‘real physicalism’ when really I only mean ‘physicalism’ – realistic physicalism.

Here, the label physicalism will mean what Strawson refers to by real physicalism, namely a direct approach to reality that is not biased by physics. An equation captures the mathematical structure of the relation between phenomena, but does not contains the nature of phenomena. Phenomena are not only the bundle of their functional relations. Phenomena are something in themselves. Can we grasp their nature or is it going to be forever out of our experiential reach? Physicalism in its broader sense should encompass everything our world and life is made of, experience included.

Everyday physicalism does not seem able to do so. Neither does physics-alism. For explanatory purpose, I outline here a convenient strawman, namely a general plausible schema of the theoretical background from which both the layman and most scholars move, call it the *standard view* or *naïve materialism*. Of course, it is difficult to pinpoint any author who would subscribe exactly to it. However, it is fair to maintain that it such a conceptual framework is shared by the vast majority of scientists and philosophers.

This conceptual framework outlines the playground where an explanation of the mind is expected to be found. For the sake of the present discussion, the standard view, on which naïve materialism dwells, is the view that:

1. The physical world is made of material entities (energy is considered a form of matter, or *vice versa*) that can be observed.
2. These entities have causal powers (dispositions) that are occasionally put into use.
3. Such entities exist independently of being causally engaged; their existence is absolute.
4. These entities lack most of the properties we experience when we interact with them.
5. We do not experience the world as it is, but *the world as it appears to us*.
6. Appearances are mind-dependent.

7. The properties that constitute how the world appears are either depleted of ontological status or relocated *inside the subject's body* (e.g., color).
8. Time is a series of punctual instants
9. Each instant is, only once, the present.
10. At any time, the whole world and our experience must fit into the same punctual instant.
11. The subject is, give or take, located where is the body
12. Very mysteriously, experience represents the world.

Of course, endless variations can be envisaged. For instance, the list of fundamental physical entities has varied considerably over the years. However, it is fair to maintain that many scientists will find themselves at ease with this list. The standard view is neutral on the question of whether the basic entities are objects, individuals, or events. Moreover, the model is also neutral as to the debate about presentism, eternalism, and the like (Hoefer 1996; Callender 2002; Dolev 2007). The standard view is somewhat akin to Locke's distinction between primary and secondary properties. Clearly, in this picture of the world, only causal powers are subject to empirical verification, since only causal differences translate into experimental results. The standard view evicts reality from our experience and requires that experience is not what the world is, but how it appears. Experience is thus epistemically downgraded and ontogenetically diaphanous. A highly platonic spirit permeates the whole view. Once this Kantian *zeitgeist* is accepted, there is no way back.

When presented in this way, nature is the club that would not accept us as its members. If nature were as the standard view suggests, we would not fit into it. Our experience would not only be intrinsic to whatever it is that we are, but it would also be *extraneous* to the physical world as stated. Our experience would be superfluous, aka phenomenal! All events, our bodies and their wanderings included, could take place without any experience involved. The standard view yields a zombie world. The hard problem follows automatically. The standard view is Groucho's club. Even dualism and panpsychism would be only metaphysical allowances to an otherwise complete and self-sufficient physical world.

The standard view encourages us to believe that the world is devoid of those features that we experience everyday – temporal duration, experience, macroscopic objects, quality, perspectivalness, and privacy (just to mention a few of the most conspicuous absences in the scientific description of the world).

Naïve materialism is a further simplification of the standard view. Basically, it is a framework in which objects have objective properties and subjects perceive them through experience, whose properties are immaterial. Subjects strive to understand the true nature of objects hampered by a vicarious level, which is their

slanted perception. Naive materialism is usually flanked by various forms of internalism that place selves subjects in a mental internal domain concocted by brains. It suggests that the world we experience is created by a *special object*, the brain, using *special-yet-unknown* properties thanks to *special-yet-even-more-unknown* relations with the actual world. It is a very anticopernican stance. Surprisingly, naïve materialism is found sufficiently clear and acceptable by most readers and commentators.

However, *pace* past scholars' authority and popular opinion, the standard view is highly questionable (Whitehead, James, Strawson), let alone naïve materialism. For instance, how do we know that the properties of our experience are not part of the physical world like everything else? Why should they require a special domain? Only because they are not the kind of relational-functional structures that mathematical equations handle so cozily? Hardly. If they were not part of the physical world, how could we experience them? In addition, how could we fit in a physical world, if the very thing we experience round the clock – the familiar world made of colors, smells, shapes, and the like – were simple appearances? Moreover, if such appearances were epiphenomenal, why did natural selection bother to instantiate them? As we will see, the mind–body problem and the cognate hard problem are not genuine discoveries – rather, they are the offshoot of a cohort of unwarranted assumptions and skeptical arguments. I will challenge them all.

## 2.2 The digestive model of the mind

Since the dawn of modern civilization – after millennia of fights, rocks, clubs, animals, hunger, and starvation – two metaphors have played a crucial role in shaping the Western conceptual landscape. On the one hand, the world has been conceived as a collection of bouncing billiard balls and cues. Are they not the civilized version of rocks and clubs? On the other hand, the mind has been conceived as a ravenous animal driven by a perennial hunger. Consider the computational model of the mind: (in)putting, filtering, processing (computing), storing, (out)putting. Is it so different from ingesting food, digesting it, storing fat, taking advantage of the positive outcomes (energy, cell replacement), and finally expelling of the undesired byproducts? The template is familiar. Is perception not akin to eating? Is computation not informally referred to as *number crunching*? Where does the word *byte* come from? From biting, of course. Finding the solution to a problem is idiomatically expressed as 'cracking a nut.' And so forth.

This digestive conception of the subject recurs frequently in all the disciplines dealing with the mind. For one, in 1983, George A. Miller coined the term

“informavore” as an analogy for how organisms survive by consuming negative entropy (*italics mine*, G. A. Miller 1983):

Just as the body survives by ingesting negative entropy, so *the mind survives by ingesting information*. In a very general sense, all higher organisms are informavores.

The same term has been used by several authors with a corresponding emphasis on information as something that is eaten, mumbled, chewed, swallowed, ingested, and engulfed (Pylyshyn 1984; Pinker 1997). Daniel Dennett, the master of metaphors, develops such a notion into a full-fledged allegory, according to which (Dennett 1996, 4:82):

Animals are not just herbivores or carnivores. They are [...] informavores. And they get their epistemic hunger from [...] specific epistemic hungers of millions of microagents.

In neuroscience, information is something that is swallowed, transformed, transmuted, processed, interpreted, and, mysteriously, transmogrified into consciousness. Minds are expected to store information as bodies store fat. An authoritative review summarizes the dominant view as (Dehaene and Changeux 2011):

[the problem of consciousness is] how an external or internal piece of information goes beyond nonconscious processing and gains access to conscious processing, a transition characterized by the existence of a reportable subjective experience.

Thus, information is taken to be a kind of stuff that is internal or external, that travels inside and that is part of either conscious or unconscious processing. This is as Cartesian as it can be, albeit in a respectable scientific disguise, of course! We have all the elements for a successful scientific allegory: the hunger, the food, the digestion. A similar notion was formed on the basis of the (only apparently) rejected notion of the eidolon, introduced by Democritus – that every object continuously emits eidola, so that our eyes, like little ravenous mouths, capture and swallow them (Lindberg 1976; Antonova and Kemp 2010). To allow eidola, or something akin to them, to slide smoothly inside one’s brain, the optic nerve has been erroneously depicted in axis with the pupil for centuries – eidola cannot bounce too much! In their drawings, Leonardo, Vesalius, and Descartes sketched the optic nerve at a wrong angle because they were biased by assuming that the pupil was a sort of mouth and the optic nerve was a sort of esophagus. Only in 1619 the eccentric exit angle of the optic nerve was drawn correctly for the first time, by the Jesuit Christoph Scheiner (Daxecker 1992; Scheiner 1619). Yet, even when the eidolon was set aside, the vision theories stemming from Alberti and Brunelleschi’s visual pyramid were still conceived in terms of something that had to be engulfed from the external world.

In current models, in both neuroscience and cognitive science, the role attributed to information is roughly the same as that attributed to the eidolon – it is something that gets trapped and ingested. As in Giovanni Battista Della Porta's likening of the *camera obscura* to the eye, the received model of vision is based on capturing and storing images them somewhere. Once again we face a hunt-inspired model. Don't we not *shoot* photographs? In the '70s, cognitivism and computational models of vision poured new wine in old wineskins.

Consider the seminal model of visual perception defended by David Marr (Marr 1982, 31–37):

Vision is a process that produces from images of the external world a description that is useful to the viewer and not cluttered with irrelevant information. [...] the initial representation consists of arrays of image intensity values as detected by the photoreceptors in the retina [...] Vision alone can deliver an internal description of the shape of a viewed object [...] The main job of vision [is] to derive a representation of shape. [36] [Vision] is a sequence of representations [...] designed to facilitate the subsequent recovery of gradually more objective physical properties [...] The objective of many early computations is to extract this information.

In cognitive science, the leading metaphor is akin to digestion insofar as internal computation processes raw information to extract useful and more refined information, just as the intestines work hard to extract useful and more refined chemicals from ingested raw food. Poignantly, Mark Johnston stressed the relation between food ingestion and perception: “[T]he metaphors of knowledge [...] are metaphors of touch and digestion; we grasp things, digest facts, absorb points, assimilate information [...] Digestion is of course just touch gone to extremes” (Johnston 2002). Searle proposed the same notion a few years ago (Searle 1984, 50):

Think of the mind and mental processes as biological phenomena which are as biologically based as growth or digestion or the secretion of bile. Think of our visual experience, for example, as the end product of a series of events that begins with the assault of photons on the retina and ends somewhere in the brain.

The modern version of the eidolon is thus information – *something* that goes from the external object into our brain. We ought not to be surprised if information is always something that is swallowed, chewed, processed, stored, secreted, and expelled. Once again, the metaphor is that of eating: thinking is digestion; information is food; memory is stored fat. Strikingly, Burrhus Skinner wrote that (Skinner 1971, 191–92):

[...] much of the misunderstanding about an inner man comes from the metaphor of storage. [...] the personal history of the individual is also often said to be stored within him. [...] The environment is often said to be stored in the form of memories.

It is worth mentioning that the founders of information theory, Shannon and Weaver, were adamant that information is not the kind of thing that is swallowed, digested, and finally expelled. Information is a quantitative estimate of the uncertainty between two events. No information travels literally along the communication channel like a letter carried by a mailman (Manzotti 2011). Information is a measure of a probability connected to the channel as a whole. It is neither a property of *something* travelling through the channel (Shannon 1948, 379) nor a substance, although some scholars like Tononi would probably endorse such a notion.

### 2.3 The hallucinatory model of perception

In parallel with the digestive model of perception, an empirical fact has suggested a separation between experience and world – namely cases in which appearance and reality seem disconnected such as hallucinations, dreams, and illusions. What we experience seems to be different from what is there – the arguments from illusion (Austin 1962) and from hallucination being two popular versions. As a result, perception has largely been modeled on hallucinations and dreams rather than the other way around.

Dating as far back as Plato, everyday perception has very often been conceived in terms of a reliable, environment-driven dream or hallucination. The assumption that we only see the world as an appearance has been momentous and ubiquitous – Plato's cave, Descartes' mental theatre, Kant's phenomenon/noumenon dichotomy, and cognitive representations are various versions of the same fundamental hunch. The pervasiveness of such a model, particularly in cognitive science and neuroscience, has booby-trapped any successful attempt to establish a contact between experience and the world. Since Descartes' and Galileo's time, this intuition became formalized in its modern form, either in terms of mental images or by means of other sorts of vicarious internal theaters or screens. Kant's phenomenon is yet another example. Jumping to today, Marr's seminal work has influenced – and continues to influence – many scholars to believe that, by means of internal computation, a visual agent constructs an internal representation of the external world (Marr and Poggio 1979; Marr 1982). Such representations get then mysteriously, and largely uselessly, tinged with phenomenal character to transmogrify into our familiar everyday experience. This stance has been dominant in the philosophy of AI and the cognitive sciences, although it has received some classical criticism (Brooks 1991; Brooks 1990; Pfeifer and Bongard 2006).

The external object is thus nothing more than the alleged trigger – useful, but not necessary. *Mutatis mutandis*, the same notion has dominated the

literature on perception, in both psychology and neuroscience; perception has thus been increasingly equated with a hallucinatory yet reliable state. Since Freud, perception has been compared to a remembered present (Freud 1920; Edelman 2001; Meyer 2012; Edelman 1989). In this regard, Edelman wrote that (Edelman 2001, 119):

Perceptual (phenomenal) experience arises from the correlation by a conceptual memory of a set of ongoing perceptual categorizations. Primary consciousness is a kind of “remembered present.”

Likewise, Lehar claimed that “the primary function of perception [is] that of generating a fully spatial virtual-reality replica of the external world in an internal representation” (Lehar 2003, 375). We have been led to believe that we live in a dream-like virtual world of pure mental appearances not unlike the mental world depicted by popular blockbusters – e.g., *Matrix*, *Inception*, *In & Out*. Such a view has been dubbed the *Matrix-model* of consciousness (Chalmers 2003) and is an updated sci-fi cinematographic version of the Cartesian theater (Chalmers 2014). Coherently with this view Chalmers stated that:

Right now you have a movie playing inside your head, it’s an amazing movie, with 3D, smell, taste, touch, a sense of body, pain, hunger, emotions, memories, and a constant voice-over narrative. At the heart of this movie is you, experiencing this, directly. This movie is your stream of consciousness, experience of the mind and the world.

Yet, nobody has a clue as to what the movie, the film, the screen, the actors, and the spectators are! It is surprising that Chalmers is not worried by the dangers of an analogy between traditional representational technologies – theatrical scenes, the cinematograph silver screen, the computer screen, and virtual reality headsets – and experience. These cases are based on something that physically resembles what it represents – for instance, a picture on the little display inside a stereo head-mounted display – while experience does not have any neural silver screen (or display, theater, or background) over which to physically smear a copy of the external world.

What is important here is not the kind of internal structure that is used to cope with the environment. It is obvious that, in one way or another, a physical agent must have an internal machinery to keep track of the environment, its goals, its preys, and its enemies. Such internal gears can be called representations, but such a label does not transmogrify them into experience. I can label a variable in my code as a “representation”, but the variable is nothing but a functional link in a long causal chain. The key issue is whether experience is the result of such internal structures or something else all together. On top of this, ‘internal to the mind’ does not necessarily mean inside the brain.



Internal structures – the cognitive gears – play a functional role no different from that played by punched cards, transistors, beer cans (to borrow one of the favorite examples in the recent philosophical discussion). Yet, such a functional role does not address, imply, or explain the fact of experience. It is a different explanatory level. Functional representations – i.e. all representations we know of – offer no account for experience. And while representations – understood as internal functional gears – are indeed inside the head, they are not experiences. Of course, the representationalist position is not necessarily that representations are experiences, but rather that representations fix the phenomenal character of experience. However, we have no working account of how and why functional representations should indeed have a role in determining phenomenal character. Nor we have any substantial reason to attribute to functional representations an ontological status. Representations are an enthralling conceptual epicycle insofar as they provide an intermediate link between the world and the subject. Likewise, misrepresentations promise to offer a straightforward yet possibly misleading solution to the issue of misperception.

An influential tradition (Descartes 1637; Austin 1962; Ayer 1940; Russell 1912) has deployed misperception as a conceptual battering ram to downgrade perception to a case of reliable world-matching hallucination. The standard argument is based on what came to be epitomized as the *common-kind assumption* – namely, no introspective difference between hallucinating a red apple and seeing a red apple holds. The two experiences belong to a common kind. If this is the case, what one sees must be the same in both cases – namely, a *mental* red apple. Thus, hallucinations win. The hallucinatory view of perception is further backed up by the argument from illusions and its cognates (Ayer 1967).

The same rationale has been developed countless times and the notion of sense data is among its offshoots – something that ought to be the real object of one's perception (Russell 1912; Broad 1925; Ayer 1940) – and, more recently, the notions of qualia and *phenomenal character* (Stubenberg 1998; Tye 1994; Kanai and Tsuchiya 2012; Shoemaker 1994). A sense datum ought to be the thing that I see *both* when I hallucinate (or dream) a red apple *and* when I see it. The only difference is that when I see a red apple, my sense datum is caused by a red apple, while during a hallucination it is caused either by some endogenously produced neural activity or by some unfathomable divine cause. As is well known, the doctrine of sense data fell into disrepute because of the difficulty of assigning a meaningful ontological status – nobody had a clue as to what and where they were. It is worth to stress that the need of an additional entity, like sense data or qualia, or properties levels presupposes we have an exhaustive knowledge about the nature of the physical, which we do not have. It is a combination of naïve materialism and physics-alism: sketching an oversimplified notion of the

physical object and then placing what does not add up in the all-too-convenient mental dustbin.

However, as previously mentioned, neuroscience still believes in something akin to sense-data modulo ontological commitments (Uttal 2001; Manzotti and Moderato 2010; Bennett et al. 2007). Consider Marr's internal representation, Tononi's integrated information (Tononi 2004; Tononi 2008), or Tegmark's *perceptronium* (Tegmark 2014). In all such cases, the thing that one perceives is no longer the actual object – the red apple – but rather a vicarious entity that is the true object of one's experience: Marr's internal mathematical model, Tononi's integrated information, or Tegmark's perceptronium. How these alleged entities produce our experience – which is taken to be alien to everything else in the physical world – remains a mystery only partially veiled by the alleged authority of a mathematical disguise. As in the case of sense data, in these models, everyday perception and hallucinations belong to a common kind: the only difference is that in everyday perception the distant causal trigger of the internal entity is an external object. Therefore, because of the common-kind assumption, the direction of the explanation goes from the hallucinatory case to the everyday perception case. I dub this attitude the *hallucinatory model of perception* – i.e., perception is explained as reliable hallucination.

According to such a model, one never sees the actual world. Rather, one sees a virtual mental world – i.e., a hallucination aka a phenomenal layer coating the real world – that is allegedly concocted from past memories. How such memories borrow their perceivable properties from the world is, of course, never explained. Thus, the hallucinatory model does not provide any clue as to how and why experience can arise from neural activity through causal interaction with the external world. Nor does it explain why the ontology of memory should be any clearer than that of perception – placing additional distance between the world and experience does not seem to solve the problem, instead it makes it worse. The relation between experience and world is mysterious – the relation between experience, memories (or categories), and world is even worse.

To recap, although the layman never questions the hallucinatory model of perception, the model is problematic for a series of reasons:

- Hallucinations are the exception while everyday perception is the norm.
- Hallucinations are constrained by perception, not the other way around.
- Hallucinations do not produce new phenomenal content.
- The hallucinatory model is either ontologically committed to an additional entity or skeptical about introspective reports.
- The hallucinatory model endorses a distinction between appearance and reality.

In the following, I will defend empirically the first three points against the popular belief that hallucinations are arbitrary mental content. The last point requires immediate attention. Since the demise of sense data, philosophers have tried to find ways to avoid positing any intermediate entity – various stripes of realism are good examples. Overall, disjunctivism has been the most successful strategy (Byrne and Logue 2009; Haddock and Macpherson 2008). Disjunctivism tries to avoid falling into the trap of additional objects of perception by rejecting the common-kind assumption. However, to the best of my understanding, keeping hallucination and perception apart does not help to explain either of them. Rejecting the common kind assumption multiplies the unresolved issues. Moreover, disjunctivism falls short from providing a positive account of perception. Finally, the lack of introspective difference ought to be positively justified rather than postulated.

## 2.4 Physiological minds and mechanical worlds

A popular model conceives of the mind as some kind of organic juice secreted by its proper organ, i.e., the brain. Historically, this view stems from the 16th-century idea that subjects can be reduced to their bodies, while objects can be reduced to a quantitative platonic mathematical model – medicine for human beings, and physics for nature. In this regard, Galileo's ubiquitous statement is key (Galilei 1623):

I judge that, if ears, tongues, and noses were taken away, the number, shape, and motion of bodies would remain, but not their tastes, sounds, and odors. The latter, outside the living organism, I believe to be nothing but mere names.

Here, Galileo is reaffirming the very commonsensical notion that the mind is created inside the body. Galileo applies to the mind the strategy that proved so successful with most living functions. Contemporary neuroscientists do the same. As of Vesalius's dissection of King Henry II's head, European physicians have increasingly held that the human mind must hide somewhere inside the human body (Kean 2014). After all, physiology has had one big success after another by looking for organ-centered explanations of several bodily functions (Table 1) – muscle for movements, immune system for resistance to infections, heart for blood pressure, and so forth. Galvani's frog legs or Harvey's blood pressure are successful examples. Given that a strategy has been successful in so many cases, why should it not work for the mind too? Nowadays, it is almost a platitude that neuroscience is – or will soon be – the science of the mind. Which organ might be better suited to producing the mind than the

neural system? Only a handful of authors have disagreed, for a variety of reasons (Manzotti and Moderato 2013; Manzotti and Moderato 2010; Uttal 2004; Uttal 2001; Gopnik 2013; Satel and Lilienfeld 2013; Rose and Abi-Rached 2013; O'Regan 1992; Noë and Thompson 2004). Yet, maybe the mind is not the kind of thing that organs secrete.

Even critics of the cortical localization of mental functions, such as William Uttal, have felt the need to warn that they do not want to challenge the most basic principle of psychobiology or cognitive neuroscience, namely that “any human mental process is solely a reflection of or equivalent to some aspect of brain activity” (Uttal 2001, 206). Once again, this stance is anticompernican insofar it suggests that the living body is capable of something more than inanimate matter. With the necessary modifications, the notion of special neural activity is akin to this view. Many hypotheses in neuroscience, ranging from Müller's specific energies up to Tegmark's perceptronium share the same explanatory structure.

As soon as the Western world started to apply the experimental method to the functions of the human body, it became increasingly clear that such functions were the outcome of bodily structures. Physiology became the fundamental discipline for the study of man. As a result, from a materialist angle, man has been taken to be nothing more than a body. Armstrong and the rest followed a very crowded path. More recently, neuroscientists narrowed such a notion, placing the core of man, namely the mind, inside the central nervous system, often the brain or a subset of it (Dehaene 2014; Zeki and Bartels 1999; Koch et al. 2016b; Koch 2004; Tononi 2004; Revonsuo 2006; Crick 1994). Why? As I will argue for at length in this book, this move was empirically unsupported and theoretically unnecessary.

Yet, from an epistemic angle, identifying the physical basis of man with the human body has proven to be a move with significant advantages. Both to the layman and to the scientist, the body offers a feasible and, above all, observable target of research. Subsequent disciplines or views, such as behaviorism, ecological psychology, environmental psychology, enactivism, and embodied cognition, have tried to refute this attitude, but it was too late.

Pertinently, the word ‘physician’ means someone devoted to the study of the physical underpinnings of human beings. The offshoot of all these – forgivably despicable – ambiguities was the confusion between the study of human beings’ physical underpinnings and the study of human beings bodies. Thus, an organic explanation of the mind is based on the premise that the body and its states are all that ... *matter*. Matter is what matters and matter (or some form of it, like the eidolon or information) is what gets into one's body. Once again, we are back to conceiving of the mind as some kind of digestive process.

**Table 1.** The successful story of physiology in locating functions has generated the expectation that neurophysiology is the discipline that studies the organ of the mind – the brain

| Function                        |   | Organ             |
|---------------------------------|---|-------------------|
| Circulation                     | → | Heart             |
| Respiration                     | → | Lungs             |
| Digestion                       | → | Stomach and liver |
| Movement                        | → | Muscular fibers   |
| Infection resistance            | → | Bone marrow       |
| Experience, consciousness, mind | → | Brain?            |

However, nothing compels the material basis of one’s existence to be confined to one’s body. It might be the case, or it might be not. It is an empirical matter. Whether or not our existence is constituted only by particles inside our skin has to be ascertained by means of empirical verification, not by *a priori* assumptions.

2.5    The object–object problem

Since Descartes, philosophy textbooks have outlined the mind–body problem as though the main problem were the connection between the immaterial mind and the physical world, i.e., the human body. Eventually, in the last century the bulk of scientists and many philosophers have abandoned the hope of an immaterial soul and have focused mostly on the brain as the seat of consciousness. Such an effort, allegedly mandatory for physicalists, has resulted in what Daniel Dennett poignantly nicknamed *Cartesian materialism* – i.e., giving the brain the same burden the soul once had (Dennett 1991, 107).

Let’s call the idea of such a centered locus in the brain *Cartesian materialism*, since it’s the view you arrive at when you discard Descartes’s dualism but fail to discard the imagery of a central (but material) theater where “it all comes together.” [...] Cartesian materialism is the view that there is a crucial finish line or boundary somewhere in the brain, marking a place where the order of arrival equals the order of “presentation” in experience because what happens there is what you are conscious of. Perhaps no one today explicitly endorses Cartesian materialism.

While officially only a handful of authors have explicitly endorse such a view, the clear majority of neuroscientists have endorse similar views insofar as they take consciousness to be something that takes place inside the brain. Such an attitude is not the outcome of an unjustified fondness for Cartesian dualism, rather it is the logical consequence of assuming physicalism together with an unjustified

additional premise, namely that the mind is located inside the head. The rational is straightforward – if physicalism is true, consciousness must be physical too and thus it must be somewhere. The brain is a feasible option. However, so far it has not had any empirical confirmation. As a matter of fact, all available empirical evidence shows that the brain is necessary for conscious experience to happen, but *there is no evidence that the brain is sufficient for consciousness*.

Give or take, Cartesian Materialism restates Armstrong's mind-body, or mind-brain, identity theory, which is something that John Dewey has already remarked upon, stressing that "the older dualism of soul and body has been replaced by that of the brain and the rest of the body" (Dewey 1916, 336).

However, if we take any stripe of the mind-brain identity theory seriously, we will have to face the *brain-world problem*. In fact, if the brain is the physical thing that perceives the world, how is it possible that a brain sees the external world? How is it possible for a brain to partake of the properties of the external world?

After all, the brain is just an object and – like every other object – it has only the properties it has. The brain is gray, gooey, and soft. How can the brain borrow any properties from the outer world, say from a red aromatic rose? How could colors creep inside the skin envelope? How could the pale blue of the morning sky be replicated inside the pitch dark of the skull? These questions may appear simplistic if not irritatingly naïve. Yet ... has all the debate about representation, cognition, computation, and information processing ever answered them? Hardly.

The fact is that, no matter what a piece of matter does – be it a gear, a registry, a computer memory, or a neuron – it remains unchanged. It is still the same piece of matter. No observable difference takes place. *Function and role change neither the nature nor the properties of matter*. A brain remains a brain, no matter what it does. A brain does not have the properties of the mind.

As regards consciousness, the cognitive sciences have striven hard to show that functioning will produce novel emergent properties. Many scholars have claimed that computations and information are real features emerging out of the physical basis. Yet, if it were true, such additional ontological layers should be either epiphenomenal or causally redundant – two equally undesirable options. Yet, the problem is both simpler and deeper than that. In a physical world, there are only physical entities with their properties. A physical entity – e.g., a brain – that aims to experience another physical entity – e.g., a rose – is asked to achieve an impossible feat: keeping its own physical properties and, at the same time, instantiating the physical properties of the object. Is it not too much?

I am aware that many authors have – to various extent – suggested an ontological status for functional, cognitive, representational, and teleological states. However, this is a case of *obscurum per obscurius* – to explain an mystery by something still more mysterious. If the phenomenal has no place in the physical

world, why should it be any clearer to introduce additional levels – for instance, the teleological? Furthermore, is it not suspicious that such levels are called into question precisely in the case of the mind? From the observation of nature, we do not see anything like additional levels, we see only physical phenomena. Nobody has ever observed anything like a functional or a teleological state as something over and above their physical underpinnings. Such additional levels have not been observed, they have been postulated as a conceptual crutch for the mental. This is reason for concern.

The Cartesian mind and the Aristotelian soul had much greater ontological latitude than current neuroscience and its naïve materialist framework. The classic immaterial mind was capable of changing its form. Famously, Aristotle deployed the potency/actuality machinery to allow the soul to be all things (to borrow the form of objects). Descartes conceived of ideas as copies resembling their objects. Yet, such cozy metaphysical devices had to be abandoned once the grim reality of a purely physical world became the norm. There are no ontological free lunches. Cartesian materialism requires infeasible ontological allowances.

In a physical world, there are only physical entities – mostly objects. Thus, in a physical world, the real problem is no longer the mind–body problem, but rather the brain–world problem or, to put the issue even more crudely, *the object–object problem*. How can an object experience another object? The only thing objects do is existing. Is existence enough to endorse experience?

## 2.6 Inner man and inner world

Nobody believes or speaks anymore, of the inner man – the mocked *homunculus* – yet many authors still seem comfortable with the idea of an inner world in which, free from ontological commitments, one can place feelings, emotions, thoughts, dreams, simulations, 3D replicas of the external world, movies, models of the world, mental workspaces, and so forth. What and where should the inner world be? Inner to what? To the physical underpinnings? To a logical space? To an immaterial mind? The notion of ‘inner’ is clearly thorny. It is plagued by endless difficulties and it ought to have been disposed of many years ago. Nevertheless, it keeps resurfacing in the neuroscientific literature, undoubtedly as another vestigial remnant of the digestive notion of the mind.

A recurring conceptual pattern leads invariably to an internalist view of the mind as something secreted by the brain. Give or take, the pattern proceeds as follows. First, one assumes that the world is different from how it appears. Then, one has to find a proper location for appearance. Dutifully, one denies any ontological weight to appearances. Still, one has yet to include the mechanism that brings

appearances into the scene. If one is a physicalist, appearances will be somewhere. By the same token, if one adopts the popular belief that the mind is inside the body, one will be faced with an impossible conundrum. If one puts them in the external object, one is back to square one, because one should then explain how they are perceived by the brain, which is just another object. There is only one possible move – namely, to locate either appearances or their supports inside one's body (or brain or mind). However, this move is equally dangerous because it leaves open as many thorny issues as leaving everything outside one's body: (1) *Why should being internal to the body (or brain) entail being closer to one's experience?* (2) *Why should it be easier for a physical process inside my body to relate with experience than for a physical process in an object?* Nonetheless, a covert appeal to an inner world and an inner man is practically ubiquitous.

Why should the inner world have rules different from those of the outer world? Why should reality admit private enclaves that cannot be observed? The very idea of an inner domain emerged from the assumption of the separation between subject and object, not the other way around. Probably, though, it received a further boost from the identification of subjects with their bodies and from the aforementioned digestive model of the mind. After all, what metaphor is better than the stomach when establishing an inside/outside dichotomy? Did Pinocchio not find his father and many other leftovers of the outside world inside the belly of the whale? The belly is a biological version of Plato's cave which is, in turn, an allegory of the mind. We are covetous of our belongings, and we want to keep them in truly inaccessible safes, vaults, and strongboxes. The notion of a private domain for our unmentionable thoughts, sinful desires, unpresentable beliefs, and embarrassing feelings is all-too appealing to resist. As we hide our bodies behind clothes, so we are happy to keep our thoughts under wraps in the alleged interiority of the mind.

Yet, *the physical world is not modest*. Everything clamors to be seen and everything is, so to speak, in plain sight. A physical phenomenon is, first and foremost, a moment of existence. The differences among phenomena are only of a practical nature. Apart from the mind, everything is in plain view. Apart from the mind, nothing else requires or, indeed, suggests the existence of an intrinsic, interior, hidden nature of things. On the contrary, physical existence is always consumed and ascertained by means of its visibility. Apart from black holes, nature does not offer any retreat where things can withdraw. Nature is ontologically flat. All physical entities are completely present and thereby accessible. It would be hopeless to look for the notion of interiority in physics. Physical entities have no ontological inside. Nature is *ontologically naturist*!

The debate about the intrinsic nature of physical entities has largely been motivated by the contrast between experience and the physical world (Russell 1927).



The former was known by direct access, while the latter was known only indirectly by means of functional relations. Yet, such a debate was an offshoot of the alleged separation between subject and object. The fact is that nature offers itself to us as it is. Our everyday physical world is colorful, tasty, aromatic, vociferous, complex, articulated, rich, and furious. Existentially, we experience the world around the clock. Physics measures and systematizes the same world we inhabit and experience.

In this regard, Strawson formulated the slogan, *the having is the knowing*. To a large extent, the proposal I will put forward is coherent with it although I would rather express it as *the being is the knowing*. But I don't want to get ahead of myself here. Contrasting phenomenal qualities against noumenal quantities ended in a bizarre outcome: the phenomenal has been hidden as interior/intrinsic while the noumenal has become overt as exterior/extrinsic. Yet, it is the very starting step that is questionable – namely the separation between subjects and objects, between experience and world.

## 2.7 Am I my body?

Scratch a doctor and you'll find a materialist. This popular saying is the outcome of the notion that the body is the thing one is. Physicians have intimate contact with human bodies, and thus they tend to identify people with their bodies. Yet, why is the notion that our mind is inside the body so persuasive? Why have we been so stubborn to believe that, whatever we are, our bodies should be the right place to look? I will mention here a series of cultural facilitators of such a hunch. What will emerge from this list is that none of them has any scientific strength.

### *Survival*

This might appear to be a trivial issue, but it must not be underestimated. As far as we know, the survival of the mind depends on the survival of the body. Post-death experiences are not completely convincing and many hold the reasonable belief that no one has ever returned from death. Leaving aside religious beliefs, we take great care of our bodies because their survival is essential to the survival of the corresponding subjects. Thus, it makes sense to overlap the two notions. Yet, the body might only be a necessary condition.

### *Social recognition*

Little Jimmy is taking his first steps and his loving mother points a finger at his body. He believes everything she says. Where is she pointing? At his little unsteady

body walking on the carpet in the living room. His dad and his siblings also point at his body whenever they want to address him. Likewise, his teacher and lovers will point at his body whenever they want to refer to him. “Where is Jim?”, “I’m here!” In all such utterances, *here* always refers to where Jim’s body is. His first lover likes him. She tells him “you are beautiful” and, of course, being young and inexperienced, she means that his body is beautiful. She means she finds beauty in his face, his chest, his slender figure. The thing that is beautiful is, clearly, his body and nothing else. Eventually, when she will say “you’re fat,” she will, of course, mean “your body is fat.”

Years later, Jim misbehaves and spends a few weeks in prison. The law puts him in jail. Of course, the law puts his body in jail, but the difference seems immaterial. Depriving his body of freedom appears the same as depriving him of freedom. Where was Jim at 8.30pm on the night of 30 May? He was where his body was. That is what the police want to know. Thus, Jim ends up believing it. He is where his body is. Has he not always been where his body was? Yet, is it true?

### *Center of perceptual gravity*

As previously mentioned, we have the feeling of being roughly located where most of our sensory organs are. We feel ourselves to be located behind our eyes, between our ears, a bit over our mouth and not far from our nose. Yet, this fact does not tell us anything about where our mind is, as Daniel Dennett eloquently explained in his philosophical cautionary tale *Where am I* (Dennett 1978, a lot more on this later). In sum, the location of our senses tells us only where our sense organs are. It does not tell us anything about where our experiences/minds are.

### *Body impairments lead to mental impairments*

Since antiquity, it has been clear that there is a dependence, whose nature is totally unknown, between bodies and minds. You get hit on your head by a club and various effects follow. You get a splinter of a spear in your brain and you die after showing various mood changes, as Vesalius noted at King Henry II deathbed. You intoxicate your body with various substances and your behavior changes accordingly. In more recent times, thanks to the increased survival rate from gun-inflicted brain wounds, a wealth of data has allowed us to establish precise correlations between brain lesions and brain functions. Eventually, in the last few decades, brain imaging techniques have allowed neuroscience to map – with an unprecedented level of detail – the dependence between brain regions and mental functions/states/content. This is all well known. Yet, as regards the ontology of the mind, it is also largely overestimated.

In fact, all the available data shows only that certain structures in the brain – *given a standard human environment, given a human body, given a reasonably standard development, given a surrounding physical environment* – are necessary for certain aspects of the human mind. Neuroscience has not shown any evidence for anything stronger than contingent necessity. We have no evidence about the sufficiency of neural activity. If we had, the problem of the mind would have been solved. It has not.

### 2.7.5 Language confusion

Consider the expressions ‘Stephanie grabs the apple’ and ‘John hugs Joan.’ They may convey the impression that Stephanie does something to the apple and that Stephanie is some mysterious entity. Or one may mean that two subjects, John and Joan, interacted somewhat. What both sentences mean, though, is slightly different. The first sentence informs us that Stephanie’s body grabbed an apple, presumably by means of her hands. The second sentence means literally that John’s arms hugged Joan’s body. The point is that both sentences describe physical occurrences that do not necessarily have any ontological implication. The problem is that one must be careful not to confuse subjects with bodies. In other words, we often refer to bodies and we take those bodies to be subjects. Sentences and names often refer to human bodies only, and we misinterpret them.

If I read that Joan of Arc was burned at the stake on 30 May 1431, I should understand that Joan of Arc’s body was burned at the stake, not Joan of Arc herself. Literally, subjects are not the kinds of things that burn (unless, of course, one subscribes to the mind-body identity theory). This is not to say that the burning of Joan of Arc’s body was immaterial to Joan of Arc. Yet, if burning is intense and fast oxidation, subjects are unlikely to burn. It is unfeasible to think that Joan of Arc is the kind of thing that reacts violently with oxygen. Likewise, emotions, feelings, and thoughts do not literally burn because it would be bizarre to suppose that they can combine with oxygen.

By and large, language often misleads us into thinking that bodies and subjects are the same. Such semantic overlapping, though, is neither metaphysical proof nor empirical evidence. Bodies and subjects clearly have different properties. The first burn, but the latter do not.

### 2.7.6 School teachings and cultural stereotypes

By and large, scholastic teaching presents the brain as the place where thinking, perception, and emotions take place. In many countries, since elementary school, schoolchildren are taught that the brain is the organ of the mind. Consolidating such a notion, movies and sci-fi literature are often biased in its favor. In *Young*

*Frankenstein* (Mel Brooks, 1974), Igor swaps the brain of a scientist with that of an anonymous subject, 'A.B. Normal,' with hilarious consequences. Of course, the implicit premise is that the brain carried the whole mind of the guy. Likewise, in all too many movies, the brain is always the place where the mind is created *ex nihilo*. A paradigmatic example is the movie *The Man With Two Brains* (Carl Reiner, 1983), starring Steve Martin, in which brains carry whole personalities in liquid-filled jars. All this would be little more than a curiosity if it were not for the fact that it biases the way in which laymen, scientists, and philosophers conceive of the relation between their brains and their minds. We have been told many times that our brains are our minds, and thus we ended up believing it.

Of course, all the aforementioned causes of belief – survival, social recognition, language confusion, cultural stereotypes, school formation, perception, body impairments – hardly count as a proof. Yet, their role in shaping what scientists and philosophers consider feasible cannot be underestimated.



## CHAPTER 3

# Consciousness and nature

*How the brain enables mind is the question to be answered in the twenty-first century.*  
(Michael Gazzaniga)

If one reads any of the available textbooks on neuroscience, one has the impression that consciousness is a sort of dreaded guest at the end of the party, something halfway between the ghost at the end of Mozart's *Don Giovanni* and Monty Python's Spanish Inquisition – an unwelcome and unexpected guest at the merry party of science. One goes through pages and pages about the wonders of neural activity and the brain only to be confronted with an unforeseen twist: consciousness. Nothing in the awe-inspiring bulk of neuroscience suggests or anticipates the arrival of consciousness. Everything we know about neural activity, sensorimotor coordination, pattern recognition, learning, neurotransmitters, and brain architecture leaves us completely clueless about experience. The brain might well work just like any other organ (liver, heart, kidney, lungs, and muscles), performing the chemical transformations necessary to safeguard the survival of the body. No known physical activity in the brain requires conscious experience.

In this regard, David Chalmers expressed such a feeling of amazement at the beginning of his pivotal book (Chalmers 1996, 4):

Why should there be conscious experience at all? It is central to a subjective viewpoint, but from an objective viewpoint it is utterly unexpected. Taking the objective view, we can tell a story about how fields, waves, and particles in the spatiotemporal manifold interact in subtle ways, leading to the development of complex systems such as brains. [...] In contrast, the existence of conscious experience seems to be a new feature from this viewpoint. It is not something that one would have predicted from the other features alone.

Yet, such puzzlement will arise only if one starts from the premise that consciousness is generated inside the brain. In fact, if we think about it, nothing in what we know about the brain would suggest anything as momentous as the ignition of one's consciousness. There are no mysterious areas, no suspicious activities, no apparently unmotivated neural substances, no visible emergent substances unless we suppose – based on other sources of authority – that something like consciousness

will eventually appear. Thomas Huxley's famous comparison of consciousness with Djinn expresses well the persistent surprise and ill-disguised annoyance of scholars. Nobody has a clue as to how predict consciousness out of what the brain does – we know it but we do not predict it. In contrast, everything we observe inside the brain has a precise role in the complex machinery that controls body–world interactions. Yet, no experience has ever been spotted among neurons.

Such a lack of evidence should have triggered worries about the feasibility of locating consciousness inside the brain. Moreover, there seems to be no space left for consciousness in the skull. Each area is packed with multiple functions and goals. The brain is a very busy organ and all its parts appear to be committed to some fundamental function. Should such a lack of evidence suggest that consciousness is likely to be elsewhere? I believe so.

If consciousness were the outcome of brain activity, by studying the nervous system, one should get some indications that a wondrous phenomenon is being concocted. Every now and then, even the most absent-minded neuroscientist should stumble upon some evidence indicating that an important uncharted function is carried out. Nothing of the sort has ever happened. Among neurons, consciousness is conspicuously elusive, one might say that it is utterly absent!

Stubbornly, for decades, rather than admitting that there is no evidence of consciousness among neurons, neuroscientists have tackled consciousness with embarrassment, if not irritation, as something unrelated to their core business – i.e., the activity of the nervous system.

A series of influential models and premises have biased and, to a large extent, hampered the debate about consciousness of experience – models and premises that, so far, have not yielded any final empirical confirmation. Each of them is a premise at best, or a historically settled prejudice at worst. Their perceived explanatory power has been increased both by their number and by their conceptual mutual support – this is a remarkable, yet inconclusive, series of scientific and philosophical loci that I enjoy dubbing a 'rat pack.' I borrow the term 'rat pack' from the famous Hollywood Rat Pack, which was a group of actors, originally centered on Humphrey Bogart, featuring Frank Sinatra, Dean Martin, Sammy Davis, Jr., Peter Lawford, and Joey Bishop. They often appeared together on stage and in films and constituted a fun and influential group.

Likewise, the force of these common beliefs lies in their combined acceptance, but they lack any convincing force if taken one by one. In other words, most of the literature dwells on a cluster of mutually legitimizing hypotheses. If taken alone, none of these assumptions is either particularly convincing or empirically sound. Yet, taken all together, they constitute a rat pack that is almost impossible to challenge. In similar circumstances, the philosopher Alfred North Whitehead stated that (Whitehead 1925, 48):

When you are criticizing the philosophy of an epoch, do not chiefly direct your attention to those intellectual positions, which its exponents feel it necessary explicitly to defend. There will be some fundamental assumptions, which adherents of all the variant systems within the epoch unconsciously presuppose. Such assumptions appear so obvious that people do not know that they are assuming because no other way of putting things has ever occurred to them.

In this chapter, I will briefly outline a series of widespread premises. Each of them would require a whole book to be outlined and challenged. However, striving to see too many minute details would hamper a broader understanding. The point at stake is that these assumptions do not stand up by themselves. They are a toxic kind of conceptual asset. They are insolvent explanatory notes. They get credit only because people accept postponement of their verification. That is why, here, I will limit myself to a sketchy outline of each, and to a telegraphic statement of the reasons suggesting that they ought to be set aside, at least until autonomous and empirical evidence is found. My claim is that the following notions constitute Whitehead's "unconsciously presupposed assumptions." They are a series of premises that have biased the current debate about consciousness but have no real force – i.e., a philosophical rat pack.

### 3.1 Neural local supervenience and internalism

As mentioned before, a widespread belief is that if one is either a physicalist or a materialist, one must place consciousness inside the body, or, at least, one must believe in the local supervenience of the mind on the body (Kim 1998). With all due respect, why? There are no strong arguments supporting such a reduction. It is an as-yet-unsettled empirical matter. Analytically, no convincing argument shows why only what takes place beneath the skin should be relevant. While it might turn out that it is so, it might not. Physicalism does not entail that consciousness supervenes only on neural events. Why does it have to be that way? Physicalism only entails that consciousness must supervene on physical phenomena. The latter is a different statement. For instance, the minimal physical subset on which one's consciousness supervenes might be larger than one's neural system. Suppose that the necessary and sufficient physical basis for one's mind were one's body plus a ring of Saturn. While this arrangement would surely be bizarre, it would not violate physicalism. As long as the supervenience basis is made only of physical entities, it is a legitimate physicalist view. Thus, invoking local neural supervenience puts the horse before the cart. Why should physicalists of *any stripe* limit their quest to only neural processes? No known psychophysical law dictates how and why neural activity produces phenomenal experience. In the absence of any such law, we have



no reason to limit our quest to only neural processes. The physical world is larger than the central nervous system.

A position that is closely related with local neural supervenience is the broad and loose standpoint sometimes labeled internalism – namely the assumption that the mind depends only on activity taking place inside the body (or the brain or some other suitable physiological subset). In the context of the debate about enactivism, internalism, or some close version of it, has been nicknamed **BRAINBOUND** (Block 2005). Neuroscientists like Christof Koch, Atti Revonsuo, Giulio Tononi, and Semir Zeki have explicitly declared their faith in this standpoint (Tononi 2004; Tononi and Koch 2008; Koch 2004; Crick 1994; Revonsuo 2006; Zeki 2001). Christof Koch believes that (*italics in the original*, Koch 2004, 16): the goal [of the scientific study of consciousness] is to discover *the minimal set of neuronal events and mechanisms jointly sufficient for a specific conscious percept*.

The empirical evidence on which this belief is grounded remains a puzzle. In the previous chapter, we have fleshed out some historical and social factors. The most often quoted evidence is cases of misperception – such as illusions, hallucinations, and dreams – plus lesion studies.

Of course, all these authors consider the importance of the environment in shaping neural processes. However, they stress that once the brain is up and running, there has to be a set of neural events *sufficient* for specific conscious percepts (Crick and Koch 1990) – which is a sort of empirical statement of local neural supervenience. Such a stance has become widely accepted – not only in neuroscience, but also in philosophy of mind.

### 3.2 Brain in a vat are no starters

In philosophy of mind, a popular notion is the assumption that a brain in a vat ought to be capable of conscious experience even if it has never had any contact with the external world (Chalmers 2003). Philosophers feel confident that “We have good reason to believe that consciousness arises from physical systems such as brains” (Chalmers 1996, xii), yet no brain-mind law has ever been demonstrated. Likewise, most neuroscientists and as many philosophers hold that “a disembodied brain in a vat could have the same kinds of subjective experiences or states of phenomenal consciousness as an embodied brain” (Thompson and Cosmelli 2011, 164). After all, as we have seen, it is assumed that the brain produces consciousness as the spleen produces bile (Searle 1984; Searle 1992). However, how do we know that such an assumption is true? Who has ever spoken with a brain in a vat (apart from Steve Martin or Gene Wilder)? Are there any brains in a vat? Of course not. The only evidence we have is that

people are conscious. Confusing brains and people is the so-called mereological fallacy (Bennett et al. 2007). Note that a grown-up brain that is put in a vat (as in to locked-in syndrome) is not a valid case of a brain in a vat from a philosophical perspective. The philosophically-meaningful-brain-in-a-vat ought to be isolated since birth. Such a case, of course, is practically impossible and thus it cannot be used as evidence.

What is the epistemic value of a thought experiment that lacks empirical confirmation? Very little. In this case, the fact that a conscious brain in a vat is conceivable tells us more about our prejudices and ignorance than about consciousness and brains. The brain in a vat scenario tells us more about the cognitive limits of who conceives it than about what it refers to. In general, the notion of conceivability as proof has raised many concerns lately (Levine 1998; Yablo 1993; Gendler and Hawthorne 2004). By and large, we conceive outcomes that are coherent with our assumptions. Conceiving  $x$  tells us a lot more about our beliefs about  $x$  than about  $x$  itself. This is all the truer in cases that stretch our intuition very thin! A Newtonian scientist would easily yet mistakenly conceive that if I were to accelerate a photon by 1 m/sec, the photon would move at a speed of  $c + 1$  m/sec. Of course, such a prediction would be totally erroneous and its conceivability would tell us nothing about the space-time structure. If conceivability does not work for physics, why should it work for consciousness? The fact that Ned or David find it easy to conceive of a conscious brain in a vat says a lot more about Ned or David than about brains in a vat. Conceivability is a double-edged sword. We should distinguish between possibility, which is based on *what we know*, and conceivability, which is based on *what we do not know*. Drawing conclusions out of our ignorance is a questionable method.

Of course, it might turn out that a brain in a vat is conscious. Nevertheless, so far we have neither empirical evidence nor theoretical arguments. As I will show in the following chapters, *we have no empirical evidence suggesting that neural activity might produce consciousness regardless of the external world*.

And yet, for some authors, even the nervous system seems too large. Some scholars have ventured to consider whether the mind is instantiated by an even smaller physical subset! The thesis that “for every conscious state, there is a minimal neural substrate that is nomically sufficient (as a matter of natural law) for its occurrence” has been skeptically dubbed the “thesis of the minimally sufficient neural substrate” by Alva Noë and Evan Thompson (Noë and Thompson 2002, 4). Christoph Koch has suggested that “the entire brain is sufficient for consciousness – it determines conscious sensations day in and day out. [...] likely a subset of brain matter will do” (Koch 2004, 87). Semir Zeki has considered the possibility of “microconsciousnesses” taking place autonomously in the perceptual sites of the cortex (Zeki 2001). Yet even a hardcore internalist like Ned Block restrained

himself from committing to the view that “if a fusiform face area were kept alive in a bottle, that activation of it would determine face-experience – or any experience at all” (Block 2007, 482).

So far, it is fair to maintain there are no psychophysical laws connecting neural activity to the alleged phenomenal character of experience, and there is no evidence whatsoever that a brain stored in a vat *since birth* would have any experience, no matter how well fed! Due to the lack of any psycho-physical theory, it is completely arbitrary whether a certain physical state be it a single neuron or the entire nervous system has any connection with one’s experience.

### 3.3 Misperception by and large

Perhaps the strongest case supporting the separation between experience and world – appearance and reality – is provided by cases of misperception in which a difference between what one experiences and what is allegedly there seems to occur. Here I use misperception in the broadest possible meaning – i.e., perceptual errors, dreams, illusions, and hallucinations. Misperception is taken to be key because it is often presented as an uncontroversial empirical fact. Later, I will reconsider such evidence. However, I hold that, in our conceptual tradition, the possibility of misperception has encouraged representationalism. In fact, representationalism offers a straightforward explanation for all cases of misperception – they are misrepresentations. Although representationalism might still hold regardless of misperceptions, its appeal would be considerably diminished.

It is thus worth to outline briefly the three traditional cases of misperceptions: perceptual error, illusion, and hallucination/dreams (Table 2).

For the sake of discussion, as is usually done, perceptual error is modeled as a misbelief. For instance, I see my youngest son Emilio in a recent picture, and I believe I see a picture of my eldest son Giulio. Yet, there is no mistake in my perception. My perception of Emilio’s picture is perfect. However, I draw a wrong inference – I mistake Emilio for Giulio. The belief is mistaken, but the perception is not.

Illusion is more demanding. Among philosophers, the argument from illusion is defined as a case in which I perceive O as being F while, in fact, O is not F. I perceive differently. Thus, illusions are accounted for as cases of property misperception. Among psychologists, an illusion is a case in which the stimulus is able to induce some distortion in one’s sensory and perceptual process. Illusions are often explained as cases in which what the world appears to be is different from what the world is. Therefore, appearance and reality are taken to be different – the properties we perceive are taken to be different from the properties that has external object. Of course, if a different account of illusions

were available – for instance, one in which we perceive something that is really instantiated in the world – we would no longer need to separate appearance from reality. Of course, a representationalist would insist that we are separate from the external world and that the character of our experience is fixed by the representations of the world rather than by the world. Yet, the attractiveness of intermediate entities would be considerably diminished. Representations hinge between experience and reality; they here provided a cozy ontological latitude that allowed experience to depart from reality. If there were no gap between experience and reality, the hinge might be set aside. As a matter of fact, illusions are frequently explained in terms of mental appearances. In the following, I will strive to show that, in contrast with widespread notions, the empirical evidence offered by illusions presents us with a different picture – illusory properties might be revisited in terms of unexpected actual physical properties (Brewer 2006a; 2006b; 2009; 2011). Illusions may reveal to be only ill-interpreted cases of perception. Of course, if one assumes beforehand that perception is the process by which I experience mental appearances, illusions are to be explained in terms of illusory properties, whatever they are. However, such a conclusion would be nothing but the restatement of one's beliefs about illusions. If we did not have a convincing theory of perception, why should the traditional view about illusion shed any light?

Finally, consider hallucinations. They are routinely cited as the most persuasive case in which appearance departs from reality – where one perceives O as F and there is no O. In philosophy, hallucinations are cases in which what one experiences does not exist: “A hallucination is supposed to be a visual experience in which nothing, or at least no object or state external to the mind, is appearing to the subject.” (Johnston, 2002) or “A hallucination is a strictly sensational form of consciousness, as good and true a sensation as if there were a real object there. The object happens to be not there, that is all” (James 1890). In psychology, allegedly you hallucinate when you perceive something without any external stimulus at the time of your experience. Dreams, phosphenes, and hallucinations of various kinds – e.g., migraine aura, afterimages, aftereffects, Charles Bonnet syndrome – have all been considered as many instances of hallucination. If one assumed that these are indeed cases in which experience does not depend on the external world, one might conclude that hallucinations are cases of pure mental experience. Yet, once again, the conclusion betrays circularity. The conclusion restates the premise. In fact, if one could show, as I will try to show in this book, that all hallucinations have an external object, a completely different explanation of hallucinations would be conceivable. So far, a positive account of hallucinations is missing. We have no idea how a hallucinatory content is generated. Up until then, the point remains untaken.

Table 2. Misperception

|                  | Belief             | Experience | Reality    |
|------------------|--------------------|------------|------------|
| Perceptual error | I believe ‘O is F’ | O is not F | O is not F |
| Illusion         | O is F             | O is F     | O is not F |
| Hallucination    | O is F             | O is F     | ¬O         |

An extreme form of hallucination would correspond to those cases in which subjects allegedly have an experience of something that they have never encountered in their life – for instance, a congenitally blind subject dreaming of colors. If this were in fact true, it would be rather astonishing. It would imply that one might experience properties that have never been part of one’s world. Where would those properties come from? Short of divine intervention, I do not see many plausible explanations and even divine intervention would count as a case of perception (since God would be the external cause). Furthermore, if such unconstrained mental experiences were possible, why should standard subjects limit themselves to hallucinating real-world properties? One might concoct unlimited new mental content! Thousands of extra hues! Alien sensor modalities! Millions of new sensor modalities! If our experience were concocted inside our mind, either neural or immaterial, there would be no limitations to the experience that one might have. Indeed, it is puzzling that our experience is so constrained by the external world. I am aware that many neuroscientists would reply that the neural structure requires development to function properly. However, such an objection is unconvincing. In fact, the crux of the matter is why we do not literally swim into a sea of additional mental properties without any obvious connection with the external world. If appearance and reality are ontologically split, let them be free! While many myths have circulated – both in neuroscience and in philosophy of mind, there have been reports of anophthalmic subjects with chromatic synesthesia, migraine aura in congenitally blind subjects, Martian colors, supersaturated hues, and so on – I will show that such cases do not stand against a thorough empirical analysis. After all, if our experience is not related to the world, *to what else should it be related?* In brief, I will argue that misperception have been source of meta physical anxiety issue only because it has been ill interpreted.

3.4    Mental and physical are different

Another suspicious chasm is the gap between physical and mental, sometimes glorified in terms of the *hard problem* (Chalmers 1996). Of course, these two groups of properties can be defined so that they are incompatible. Yet ... are they so? Why

are we so certain that the physical world does not have the resources to be like our experience? Of course, like all beliefs, the difference between mental and physical seems obvious out of constant repetition, but why should it be so? Why do so many find persuasive that the physical world is – or has to be – different from the mental world? As I will argue later, it might be the outcome of an oversimplified model of physical reality. I see a red apple and, because of historical reasons, I may have a model of the red apple that does not match the red apple I have in front of me. A curious inversion ensues. I take the model to be the real apple and the real apple to be an appearance.

In contrast, if we were able to locate our experience inside nature, why should we assume that experiences and objects are different? For one, has anyone ever seen an alleged mental property in addition to the occurrence of something physical? When you watch an apple, do you see the apple or an image of the apple? Likewise, all empirical evidence is directly or indirectly linked with our experience. Why should we assume a noumenal world? Even when I know that something exists that I do not experience directly – say, infrared – I know it does thanks to some experience. For instance, I have never experienced infrared waves. That is because I have never perceived them. Yet, I know infrared waves exist through their effects on the things I perceive. The situation is somewhat akin to being acquainted with a distant relative only through letters brought to me by other people. I have no reason to believe that the distant relative is different in kind from the mailman who brings his letters. Likewise, why should I assume that the physical phenomena I do not perceive are different in kind from the ones I perceive? Why should I assume the existence of a noumenal world? I experience the world and then I express the relations among my experiences in terms of mathematical equations – what Strawson defined the *physics-alist* image of the world. Eventually, I take such relations to be the real world and downgrade the world I experience to mere appearance. It is a rather bizarre conceptual inversion.

Why should I split reality into a mental and a physical side when I walk down the street? I do not see any separation between them. Has anyone ever been able to put a mental property next to a physical one and judge that the two indeed look different? I do not think so. I cannot separate mental and physical properties empirically since I cannot contrast mental properties with physical ones as I do, for instance, in the case of electric and gravitational properties. To do so, they should both be physical. Mental properties, as they have been conceived, are beyond empirical verification. This is very suspicious. The notion of a difference between mental and physical proprieties is not even wrong. It is meaningless.

It has usually been assumed that mental properties are indeed different from physical properties because of several attributes – e.g., quality, unity, intentionality, privateness, perspectivalness, and so forth. Yet, as I will argue later, these

attributes may be the conceptual offshoot of the very assumption they should back up – namely that mental and physical properties are different in kind. For instance, intentionality is postulated as a solution to the fact that mental states are either about physical states or about intentional objects. Yet, such a hypothesis stems from the premises that mental and physical states are different. If a mental state were one and the same with its object, no intentionality would be required. Or, consider privateness. Allegedly, mental states are private because they cannot be publicly observed. Yet, it may be that they cannot be observed because we are looking for them in the wrong place. Thus, they might be visible, after all, if only we looked for them in the right place. And so forth.

When I walk down the street, my experience is one and the same with the physical world I am strolling through. I experience the sun, the trees, the wind and other people. The very idea that what I experience is something else, a sort of phenomenal veil, is the outcome of the assumption that subject and object are separate. Here, I will try to start from a more neutral background. The point I want to make is that, *pace* phenomenalist, it is far from obvious that our experience is different from the world. As it has been argued by many, our experience is transparent (Harman 1990; Martin 2002) – leaving aside cases of misperception, experience shows just what the world is. The transparency of experience has also been endorsed by recent presentationalists (McDowell 1994; Martin 2002; Campbell 2002; Tye 2009). For instance, John Campbell stated that (Campbell 2002, 116):

[T]he phenomenal character of your experience, as you look around the room, is constituted by the actual layout of the room itself: which particular objects are there, their intrinsic properties, such as color and shape, and how they are arranged in relation to one another and to you.

Thus, many authors have noted that our experience is very much like the world we live in. After all, if such a world were different from our experience, how could we access it to verify if it is really different from our experience? There would be no way. The problem with presentationalism is that the such authors are biased by the premise that the subject and the object are different. Thus the subject experiences an object that is, sadly, different from the physical object. Classic phenomenalist and sensist have held that one experiences a phenomenal object – e.g., a sense data. But, of course, such a hypothesis is empirically untenable. Representationalists have considered the possibility that the phenomenal character of what one experiences might be fixed by the external world. Yet, this stance requires a series of demanding ontological assumptions about the nature of representation and the relation between them and the world. Why should the phenomenal character of experience be fixed by one's mental representations? Finally, presentationalists/realists/relationalists suggest a more straightforward answer. Our experience

is constituted by a tract of the external world. However, they are still somewhat vague as to why and how a tract of the external world should be experienced if the subject is different; not to mention to whom the world is presented.

In addition, one more reason to distinguish between mental and physical properties is that, historically, scholars and laymen alike have held that the mind is concocted by the body. As a result, they looked for mental entities *inside* the nervous system. Since they did not find anything of the sort, they concluded that mental properties could not be physical, they are phenomenal! Isn't it a silly conclusion?

### 3.5 The issue of representation and the vehicle/content dichotomy

Informally, once it was assumed that experiences were supposed separate from their objects they could be attached to anything else. Conventional representations and symbols work like that. We can attach any content or meaning we like to a symbol. However, it is extremely dubious whether the same operation is legitimate in the case of a conscious experience where there is no external user.

Experience has a representational role only if we assume that experience is different from reality. This is questionable. The inverse is questionable too – are representations enough to endorse experience? Rather obviously, they are not. Experience can be modeled and described as some sort of representation (once experience is assumed to be different from the world one experiences), but the converse is not obviously true. Furthermore, *pace* cognitive scientists, it is very difficult to define a representation in physical terms. Given an electronic circuit, is there any empirical way to ascertain whether its electronic levels are representations? Given a mark on a blackboard, is it a symbol or is it just some chalk? No objective physical test can ascertain whether a physical condition is a representation. Likewise, given a train of neural spikes, is it a neural representation or is it just a physiological discharge? In principle, there is no physical difference between the two cases. Of course, this is Searle's classic argument about semantics (Searle 1984). It is, give or take, the problem of naturalizing representations, which is still largely unresolved.

The relation between experience and its physical underpinnings is often shaped like the relation between meaning and conventional symbols. A popular account distinguishes mental content, which is what the mind refers to, from the representational vehicles, which are the processes/entities/symbols/neural patterns. As for phenomenal experience, the phenomenal content is what one feels in a particular experience, while the phenomenal vehicles are the processes that either trigger or concoct the experience. In this regard, Dennett stated that (Dennett 1991, 131):



We distinguish representing from represented, vehicle from content. We have grown sophisticated enough to recognize that the products of visual perception are not, literally, pictures in the head even though what they represent is what pictures represent well.

On the same issue, Susan Hurley wrote that “we shouldn’t confuse properties represented in content with properties of vehicles of content” (Hurley 1998, 1) – i.e., a distinction originally introduced by Ruth Millikan (Millikan 1993). *Pace* Dennett and Hurley, we have probably ended up expecting a lot more from representations and their vehicles than they can deliver. The purported advantage is that a vehicle of a red experience, so to speak, does not need to be red, and so forth. The distinction has become almost a platitude in philosophy of mind. Unfortunately, what content is in the physical world and how content is attached to its vehicles is totally beyond anyone’s understanding. In the following I will argue that, in contrast with such a tradition the only way in which  $x$  can represent red is  $x$  being red.

### 3.6 Appearance vs reality

At the end of these two – admittedly long and a bit twisted – chapters, one should have gained a fly-by view of the cultural background that recurrently leads to the assumption that the mind is separate from the world and that experience is concocted inside the body. I have dubbed this collection of unproven premises and comforting assumptions a philosophical rat pack. Yet, there are many reasons to try it. First, it leads to endless unsolvable issues about the relation and nature of the mind and the world. Second, as previously mentioned, it is affected by circularity.

For instance, consider local neural supervenience. Usually, such a notion is backed up by the plausibility/conceivability of a conscious brain in a vat. But why should one find conceivable that a brain in a vat might be conscious, since there is no empirical evidence to support that? There are no brains in a vat. The notion is persuasive because, thanks to arguments from misperception, one is likely to hold that the world is not real, but rather a simulation of an inner mental world. Yet, why should one suppose anything like an inner world? Well, one may argue that we know our mental state supervenes on brain states and our mental states take place in an inner world. And so on. But this reply would, of course, betray circularity. It is reminiscent of the Kantian fight between noumenon and phenomenon – once you step into it, everything makes sense, but only after accepting the Kantian view.

Probably, the most fundamental prejudice is that there is a difference between what the world is and how it appears. Since Plato, appearance and reality have divorced, and as a result the world has been taken to be a shadow – a mere appearance. Galileo suggested placing appearances in the *animal vivente*, and Descartes

relocated them into the mental domain. Coherently descartes, had a substantial mental domain inside which appearances could be placed. Likewise, Galileo shared the renaissance animistic notion of the living organism. Nowadays, we no longer have such a metaphysical latitude. Yet, we continue to refer to a difference between what the world is and how the world appears. Unfortunately, we can give appearances either ontological or empirical shelter. This is very worrying.

Despite all these recurring issues, the distinction between appearance and reality is taken for granted by the vast majority of scholars. As soon as appearances are finally hosted inside the mind (whatever the mind is), they set articulate into experience, phenomenal experience, mental content, perceptual content, perceptual content with phenomenal character, and so forth, in endless combinations.

The conceptual process is akin to Zeno's paradoxes. Once the distance between appearance and reality is assumed, scholars try to fill the gap by introducing intermediate entities – e.g., representations, qualia, phenomenal content, and so forth. Yet, each new addition reproduces the problem. How is representational content linked to reality? How is phenomenal experience linked to representational content? How is phenomenal character linked to phenomenal experience? Each new conceptual invention is a new point on a line that will never reach its end ... subjects will never reach their objects and *vice versa*.

However – the point merits some redundancy – the solution will not be reached by adding more and more concepts, but rather by questioning the very first step – namely the separation between appearance and reality. The point I want to make is that if it were possible to provide an account of dreams, illusions, and hallucinations in terms of perceptions, there would be no need to take into serious consideration the possibility of a radical divide between appearance and reality, between experience and world, between mind and body, between the physical and the mental.

A consequence of the appearance vs reality distinction is that we are never in contact with the intrinsic nature of the world, which is allegedly unfathomable to us. Appearance, as in Magritte's human condition, masks reality. Yet when we face the fact that we live in the world, this consequence looks self-confuting – if we do not know what the true nature of the world is, how can we know whether it is identical with or different from our experience? Furthermore, the appearance and reality gap leads to an astonishing consequence – if one accepts the standard view of reality, there is no space left for us. The mind becomes a superfluous addendum to the otherwise more or less coherent picture of reality postulated by the standard view – consciousness becomes an embarrassing leftover.

The standard view, the rat pack, and the appearance vs reality distinction have expunged us from that picture of the world. We are, once more, akin to Groucho! According to science and, in many cases, philosophy, the very thing that is my

experience cannot be observed. Yet, the separation between appearance and reality is not something I experience – rather, it is the outcome of philosophical speculation. It is not even something I observe empirically. No empirical evidence shows any ontological gap because if it were to do so it would defeat the very premise it tries to demonstrate – i.e., that mere appearances are ontologically aloof. If appearances are a physical thing, they will no longer be mere appearances. For instance, if the appearance of Stephanie were like a portrait of Stephanie, it would be a physical object that could be grabbed, seen, measured, sold, etc. Such a portrait would not pose any metaphysical questions. Similarly, if appearances were like little portraits painted over some neural canvas in people's heads, they would pose no metaphysical riddle. Sadly, there are no little portraits in people's heads. Thus, to safeguard the distinction between appearance and reality, like the fable of the emperor's new clothes, appearances have been deemed to be invisible to everyone but their owner. This is highly suspicious.

The appearance vs reality distinction is, by definition, empirically unverifiable. It cannot be falsified because its very proof would show that it is false. Thus, it is unscientific. It is not even wrong. The good news is that we don't have to worry. Once one sets aside the separation between experiences and objects, a new approach will unfold.

## CHAPTER 4

# A mind-object identity theory

*To be is to be somehow or other.*  
(Galen Strawson)

In 1959, J. J. Smart asked “Why should not sensations just be brain processes of some sort?” (Smart 1959, 141). As I have stressed, the reply has so far been negative because brain processes and sensations do not match. Crucially, such a negative reply is of an empirical character. Even in the simplest case of experience – e.g., the perception of an everyday object such as a red apple – the properties of brain processes are utterly different from the properties of the experience of the object. Brain processes are grey, gooey, and brainish; one’s experience is red, round, and applish. How could they possibly be the same? Yet, Armstrong’s physical stance is one I share wholeheartedly. If consciousness is real, it must be physical. Nature is made (only) of spatiotemporally-allocated and causally active particulars formed of matter/energy. Thus, there must be things with the properties of our experiences. Experiences, if real and thus physical, must be things. Our minds must be (like everything else) somewhere inside nature, not necessarily inside our bodies. *Where are the things that are our experiences?* Where is one’s experience of a red apple? As a physicalist, I need to find something with the properties of one’s experience, namely something that is red, round, and applish. In the physical world, is there anything with such properties? Is there any object that shares the properties of one’s experience? To paraphrase Armstrong, *if experience is physical, what physical object is experience?*

The hypothesis I will outline and defend is that *one’s experience is nothing but the object one experiences*. My experience of the red apple is the red apple. The proposed solution for a successful theory of consciousness is *identity*: not emergence, supervenience, constitution, grounding or correlation – just plain identity.

### 4.1 Identity theories and consciousness

Many successful scientific theories are identity theories. In fact, identity in kind among allegedly separate phenomena has been key to understanding nature. For

instance, evolution is an identity theory – it maintains that the process underlying species creation *is* a mixture of variation, transmission, and selection. Thermodynamics is an identity theory – temperature *is* average molecule speed. Newton's gravitation theory is an identity theory – heavenly and earthly objects *are* inertial masses. The theory of relativity is yet another identity theory – gravity is the curvature of space-time. These theories are not necessarily true, but they are successful insofar as they put forward falsifiable hypotheses about what phenomena are supposedly identical to.

In the natural sciences, identity theories are popular because they provide an explanation of phenomenon A in terms of phenomenon B. Usually, the explanation provides good reasons as to why A is identical with B – it is sufficient to show that A's properties and B's properties are the same, at least to some reasonable extent. Thus, by Ockham's razor and Leibniz's principle of indiscernibles, A is B. In science, whenever possible, an identity theory is the right thing to pursue.

By identity I mean something akin to reduction. Thus, from a logical angle, if A is identical to B, B will be identical to A. Here I mean a reduction of A to B, as Superman is reduced to Clark Kent. In science, if it is found that B is A and A is a much more general phenomenon than B, B is reduced to A. A is B.

As regards consciousness, empirically-rich identity theories eventually suffered from an undeservedly poor reputation, either because there weren't many of them or because those that were around, like mind-brain identity theories, were manifestly wrong. Traditional identity theories have suggested that consciousness is identical either with neural processes or with the properties of such processes. Unfortunately, as stated repeatedly, neural activity and consciousness do not match. Brains are gray and gooeey, while experience is colorful, full of sounds and smells. Experience is filled with all manner of objects and akin to one's world. Sadly, brains are filled only with neurons, glia, and blood.

Because of such a mismatch, many authors either rejected the identity between consciousness and physical processes (Chalmers 1996) or developed some stripe of representationalism (Tye 2002). Both options, though, step outside of physicalism. On the one hand, dualism (of any stripe) resorts to additional non-physical entities or properties. On the other hand, representationalism, too, alludes to properties that do not belong to the physical world – e.g., *having content* or *being about*. In fact, so far no physicalist account of representations is available. We have only functional accounts of representations. Representations are placeholders that play functional roles given one's goals. But, to the best of my knowledge, no physical account of the semantic or phenomenal aspects of representation is available. Intentionality and content (and possibly phenomenal character) have never been measured or observed in the physical world. They have been postulated as

a solution to the mind, but they have never been observed. In a physical world, all representations are like the rings in a tree, they have a causal relation with the rain, but neither are they nor have any representational content. The content is not there; it is not a physical property. To convince yourself consider that there is no physical test that can ascertain whether, say, an electronic level – or a chalk mark, or a neural firing – is a representation. Does a sign on a blackboard have any content? It is not something that can be physically tested. Semantic, intentional or representational content does not make any difference in physical terms. Thus, they are not physical.

Recently, more scientifically oriented approaches have striven to endorse updated versions of the mind-brain identity theories (Tononi 2004; Rees, Kreiman, and Koch 2002; Dehaene 2014; Revonsuo 2010; Tononi and Koch 2008; G. Miller 2005), although they are rarely referred to as such. Most such proposals are based on the popular premise that the physical processes *producing* experience are located *inside* the body, the nervous system, or the brain. Yet, none of these attempts has so far shown anything that looks like one's experiences. Is this not a sign that we should look elsewhere?

By and large, identity theories require a candidate to perform their magic. If one is a physicalist of any stripe, such a candidate must comply with one requirement only – it must be a physical phenomenon. Armstrong, Smart, Searle, Crick, Koch, and Tononi have suggested various brain processes as their champion. They put forward feasible scientific hypotheses as to what consciousness might be in the physical world. They have not, however, succeeded. Here, I will propose alternative hypotheses – i.e., *conscious experiences are the external objects*. Apart from the obvious fact that I will not rummage around inside the nervous system, traditional mind-body identity theories and the proposed identity theory are similar. The only difference is the empirical hypothesis about the physical candidate for identity, not in its physicalist attitude.

## 4.2 BRAINBOUND

As previously mentioned, in the '50s, many scholars endorsed the mind-body identity theory – the idea that mind is some brain process that, while still unknown, will satisfy all identity requirements when discovered (Armstrong 1961; Armstrong 1968; Smart 1959; Place 1956; Place 1988; Crick 1994). Yet, when scholars had to face the brute fact that mind and brain do not match, rather than considering a different physical basis, they took into consideration a much more controversial path. They questioned the very nature of identity: "It is precisely this apparent clarity of the word 'is' that is deceptive" (Nagel 1974, 447). In this way, scholars

maintained the old explanatory schema – the mind stews inside the body – but no expectation of identity is raised. Consider the identity statement:

mind = brain

Although it is rather manifest that such an identity does not hold (both empirically and conceptually), rather than considering something else on the right side, many scholars question the meaning of identity itself. Thus, they replaced the naïve-yet-honest identity claim with weaker notions that have no obvious empirical translation: supervenience, emergence, and correlation. From an empirical perspective, expressions such as ‘mind supervenes on brain,’ or ‘mind emerges from brain activity’ sound like ‘mind transmogrifies from the brain.’

Supervenience is a good example. For instance, Jessy Prinz reckons that “a central plank of modern materialism [is] the supposition that consciousness supervenes on the brain” (Prinz 2005, 425). Likewise, “If you are a physicalist of any stripe, as most of us are, you would likely believe in the local supervenience of qualia” (Kim 1995, 159) and ‘local’ usually means ‘local to the brain.’ Finally, Ned Block summarizes the current zeitgeist by saying that “the current orthodoxy is the view that the brain is the minimal constitutive supervenience base for experience” (Block 2005, 264). Yet, are such weaker forms of dependence between brain and mind not the old mind-brain identity theory in disguise? Of course, some of these notions are so weak and leave so much ontological latitude that, in practice, anything goes. For one, supervenience is so weak that it might be compatible with dualism. As a matter of fact, supervenience is compatible even with the view presented here. In most of the literature, though, such weaker versions of identity are used to suggest that the mind is somewhat instantiated by the brain. *Pace* Nagel, there is nothing misleading in the notion of identity unless one insists on the wrong candidate, e.g., the brain.

Notwithstanding the manifest empirical impossibility of the mind-body identity theory – possibly made more palatable thanks to weaker versions of identity – the same view is held by many neuroscientists (Crick and Koch 1998; Llinàs 2001; V. A. F. Lamme 2003; Zeki 2003; Koch 2004; Tononi 2004; Changeux 2004; V. A. F. Lamme 2006; Tononi and Koch 2014). Anil Seth states that “Any scientific study of consciousness is based on the premise that phenomenal experience is entailed by neuronal activity in the brain” (Seth et al. 2006, 10799). Christof Koch echoes this (Koch 2004, *italics mine*):

If there is one thing that scientists are reasonably sure of, it is that brain activity is both necessary and *sufficient* for biological sentience [9] [...] the entire brain is sufficient for consciousness – it determines conscious sensations day in and day out. [...] likely a *subset of brainmatter will do*. [87]

In recent times, the notion that the mind is somewhat stewed by the brain has been nicely dubbed **BRAINBOUND** by Block (Block 2005) thereby offering a nice target for the present discussion. Yet, **BRAINBOUND**, although extremely popular, has never been backed up by any conclusive evidence. No definitive evidence has ever shown that a chunk of neurons carrying out certain chemical processes could, by itself, produce consciousness – let alone be identical with consciousness. Neurons, and what they do, do not look like conscious experience at all.

The good news is that **BRAINBOUND** is essential neither for physicalism nor for identity theories. One can be a physicalist without holding **BRAINBOUND**. In fact, current identity theories are based on two key claims, of which only one is **BRAINBOUND**:

1. Consciousness is identical with a physical phenomenon (**PHYSICAL**).
2. Consciousness is inside the body or the brain (**BRAINBOUND**).

The two claims are to a large extent utterly independent. Crucially, only **PHYSICAL** is mandatory for physicalism because it requires that everything is physical. **PHYSICAL** and **BRAINBOUND** have always composed a popular philosophical bundle but they can divorce – “the meaning of physicalism is clear enough: mental states are states of the body, mental events are physical events” (Nagel 1974, 446). *Pace* Nagel, this is a *non sequitur*; it is false. ‘States of the body’ stands for **BRAINBOUND** while ‘physical events’ stands for **PHYSICAL**. The two claims are independent and autonomous. Nothing compels the physical to be reduced to the neural. *Brains are not the only physical things available*.

In fact, only **PHYSICAL** is mandatory for physicalism. **BRAINBOUND** can be either true or false. No analytical, metaphysical, or nomological laws bind **BRAINBOUND** and **PHYSICAL** together. Furthermore, as I repeated many times, **BRAINBOUND** has never been empirically confirmed.

Mind-body identity theories have not failed because **PHYSICAL** proved to be false. Mind-body theories have failed because **BRAINBOUND** proved to be empirically false since, inside the body, no physical phenomenon has ever shown any of the properties of consciousness. As a result, traditional mind-body identity theories have failed since they required both claims to be true (**PHYSICAL** and **BRAINBOUND**).

### 4.3 OBJECTBOUND

Luckily, **BRAINBOUND** is not essential to physicalism. Even more luckily, an unexplored identity compatible with physicalism has not yet been exploited – namely,



the identity between consciousness and external objects. The hypothesis leads to a *mind-object identity*. Thus, I put forward OBJECTBOUND which maintains that that *experience of an object is the external object*. We can thus set BRAINBOUND aside but, crucially, preserve PHYSICAL. Taking advantage of the previous formulation, the proposed mind-object identity can be summarized as follows:

1. Consciousness is identical with a physical phenomenon (PHYSICAL).
2. Consciousness is the external object (OBJECTBOUND).

Thus, physicalism is safe. PHYSICAL holds while BRAINBOUND is set aside and substituted with OBJECTBOUND. In this chapter, for the sake of explanation, I will consider only cases of standard perception in which what one perceives is actually there – one perceives a red apple and there is a red apple.

Suppose you perceive a red apple. Your body B and the red apple O on the table are all we need. Thus far, no extra entity is needed to model what is going on. Your body is numerically different from the red apple. Two physical entities with different properties – the apple and your body – face each other. The problem arises when your experience E of the red apple is added to such a picture. *What and where* is E? What and where is the thing that is your experience of the red apple? Either we assume that E is somewhere inside your body, as BRAINBOUND scholars do, or we suggest something else. What? The object itself.

If we assumed that E is B – or some property of B – we would face an explanatory failure. B is utterly and hopelessly different from one's actual experience; E is utterly different from the object O, too. Resorting to weaker relations, such as supervenience, does not improve matters. OBJECTBOUND offers an unscathed physicalist alternative – i.e., the external object. If neural activity is a suitable physical entity, the red apple, too, is suitable. Both B and O are physical entities. Only parochial anthropocentric prejudices would attribute special properties to the former and deny them to the latter. Why should the brain be any better than a red apple at instantiating the properties we experience when we perceive a red apple?

Henceforth, the alternative hypothesis, OBJECTBOUND, is that E is O – *the experience of the object is the external object*. In this way, E is O,  $B \neq O$ , and  $E \neq B$ . If E is identical with O, it will no longer be a mystery that E has O's properties. In fact, if the identity between object and experience holds, one's experience E and the object O *will be one and the same*. Given Ockham's razor and Leibniz's law of indiscernibles, the object and one's experience are one and the same.

To recap, as a physicalist I assume that everything is physical (E, O, and B). But what and where is E? B is the wrong choice, although it has been the standard choice so far. The proposal is that  $E = O$ .

$$E, O, B \in \text{physis}$$

$$E = O, E \neq B, B \neq O$$

After all, your experience of the object is red, round, and applish. The apple in front of you is red, round, and applish as well. Your experience has the same properties the object you perceive has. Isn't this a promising start?

In fact, many have already observed that experience is remarkably similar to the surrounding world (Harman 1990; Brewer 2011) – experience is made of objects, people, cars, buildings, trees, clouds, the Sun, and stars. The physical properties of the body and those of objects are known. They match! The brain is pinkish-grey, gooey, and bloody. The apple is red, round, and applish. Your experience is red, round, and applish. What is the thing that is red, round, and applish? The brain or the red apple? The answer is obvious – the apple! What more do we need to reckon such an obvious identity? Whenever you perceive – and thus experience – a red apple, something has exactly the properties of your experience – namely, the red apple.  $E$  is identical with  $O$ . The difference between neural activity and experience is no longer a reason to reject physicalism, since consciousness is no longer sought inside the brain. The object triggers neural processes in one's body, but both the object and one's experience are numerically different from the body.  $E$  is  $O$ . Yet, crucially,  $B$  is neither  $O$  nor  $E$ .

Philosophical intuitions might have been different if people had compared experience with external objects rather than with neural activity. If, due to various preconceptions, one keeps looking for experience in the wrong place, one will likely, yet erroneously, conclude that nothing physical is like one's experience. **BRAINBOUND** does not hold. **OBJECTBOUND** might.

#### 4.4 Where am I?

In one of his brilliant collections of essays, Daniel Dennett tells a classic philosophical tale (Dennett 1978) – the relocation of one's brain shows that we have no first-person access to where we are. In brief, he imagines that his brain has been surgically removed from his body and kept alive in a life-supporting vat. The brain, perfectly healthy, receives and sends all the usual information from and to the body. Three entities are considered – the brain, the body, and Daniel Dennett himself (whatever he is). After the relocation, the combination of brain and body is functionally equivalent with the usual arrangement – i.e., when Dennett's brain is inside Dennett's body. A radio connection guarantees that no perceivable delay hampers neither perception nor action. From a computationalist perspective, his

brain performs the same kind of processes it did before the transplant. For a mind-body identity theorist, the brain in the vat undergoes the same states that it would if it were still in Daniel Dennett's body. Thus, if one's consciousness were identical to brain processes, after the transplant there should be no difference in Dennett's experience.

Dennett considers three potentially conflicting statements: Dennett is wherever his body goes; Dennett is wherever his brain goes; Dennett is wherever he likes to be.

The first option is the most easily refutable. For both the mind-object identity theory and the mind-brain identity theory, it is false.

The second option is more controversial. While it is true for the mind-brain identity theory, it does not appear to be so. In fact, Dennett himself rules it out, pointing out that it would be difficult to deny that one is also where his body is doing something. He presents a legalistic example. Suppose that Dennett's body robs a bank in California while his brain is kept in Texas. In which state would he be tried? I am not sure that the argument is so convincing, but, for the sake of the present discussion, it is enough that Dennett had some doubt about locating himself where his brain was. This, at least, shows that Dennett is no mind-brain identity theory supporter. Moreover I would argue that it is false because where the brain goes – i.e., in the vat – there aren't the things one's life and experience is made of.

The third option offers more latitude but is extremely vague: "At any given time a person has a point of view, and the location of the point of view, which is determined internally by the content of the point of view, is also the location of the person" (Dennett 1978, 314). The option suits common sense but it leaves open many questions. First, it begs the question because it is based on the notion of person which is responsible for having a point of view and being located where the point of view is. Second, and more crucially, it introduces the notion of point of view. What is a point of view? What does it mean that a point of view's content determines one's internal location? Commonsensically, it is easy to grasp what Dennett suggests. What one sees and what one interacts with determines where one is. This is how we have an idea of our location. Imagine that Dennett is kidnapped and then released after several days of blindfolded imprisonment in an unknown location. He will immediately try to figure out the location. He will observe his surroundings. He will gather information. The process will pass through a series of stages. First, he will get a perceptual notion of where he is – say upright, on a beach, next to some palms, under direct sunlight, and so forth. Then, he will begin to extract some more complex information – his latitude based on the noon Sun elevation, the climate, the kind of vegetation, the language spoken by the people that will cross him, and so forth. Yet, all such inferences, no matter

how useful and ingenuous, imply the existence of a mind that is cognitively and perceptually efficient. Yet, where is Dennett's mind?

In contrast, the mind-object identity theory suggests a much simpler answer: one is where is the world one experiences. This reply is physicalist and does not require any vague notion. One is where one's experience is, namely where is the physical thing that is identical with one's experience. Such a thing can be far off from one's body, both in space and in time, as long the right causal process holds. If I look at the apple, I am where my experience is, namely on the table. If I look at the stars, I am in the sky, while my body is still safely on the earth. When I stare at the sun disappearing behind the horizon, I am there, where the sea meets the sunset, and my body lies on the beach. *My body is the only place where I am not!* Unless I perceive my body as a further object, of course.

The notion of point of view, on which I will return, can thus be expressed in physical terms. A point of view is the set of objects that, at any given time, are one's experience of the world. Such objects are relative to the body of the perceiver and thus their properties are correspondingly relatively singled out. A point of view is then identical with a collection of relative properties and objects. It is identical with what, traditionally, the point of view was supposed to be about.

An explanatory caveat. An object is not a punctual and absolute entity. An object is always spread both in time and space. I will outline the spatiotemporally structure of objects in the next chapter. However, to avoid misunderstandings, as of now, I stress that any object is a causally-singled out spatiotemporally entity. A face is extended across several square centimeters. A star is a sphere of billions of cubic kilometers. A musical tune is made of many events spread across time. An uttered word is spread across time too. And so forth. In brief, an object is not only a conventional and easily identifiable object – as the apple – but also a spatiotemporally spread yet physical object. Thus, when I stare at the horizon, the object that is identical with my experience, is not a single thing, but everything I am aware of in that moment – the sea, the clouds, the sun going down, the waves, and the seagulls. The composite object made of all these entities is just yet another object. It is the point of view I mentioned above. A point of view is a composite object causally related with one's body. Of course, in this book, for the sake of discussion, I will often exploit simpler cases.

Dennett's thought experiment is useful because it allows us to draw a few key conclusions. First, it shows that one is not necessarily located where is one's body. More importantly, though, it shows that our intuitive feelings can be abysmally wrong. Our belief of being behind our eyes and between our ears can be utterly mistaken.

## 4.5 Mind and world

If one is a physicalist, one should hold that the mind is physical, thus that the mind is in the world, which is the stage of all physical events. And, of course, the mind should be alike all other physical entities, namely being made of energy/matter, being spatiotemporally located, and having a causal role. In fact, such conditions are precisely those that mind-brain identity theories promised to fulfill. Their failure is the failure of a specific empirical hypothesis about what mind might be in a physical world (BRAINBOUND) – it is not the failure of the physicalist project as a whole.

The proposal defended by this book is compatible with physicalism. In fact, the core idea is that *subjects are just objects* and that what has been called ‘perception’ is nothing but the world. Thus, all the complexities of the notion of perception have likely been the offshoot of a wrong assumption – i.e., the separation between subject and object, between experience and objects, between mind and world. Perception is exposed as the simplest notion – *perceiving  $x$  is being  $x$* .

An apple is not different because we perceive it. An apple is just an apple. To perceive an apple is a way to say that my experience is the thing that the apple is. It is as though I said that an apple is part of my possession. The apple does not become different because it is mine. It is always the same thing. Being and perceiving are one and the same. Of course, normally my experience is a case of identity with a complex physical object of which the apple is only a part of it. However, if my experience were limited to one apple – e.g., I might be a meditator focusing only on one object at a time – I would be just an apple. Being  $x$  and perceiving  $x$  are one and the same. This is not Berkeley’s idealism. In fact, classic idealism (1) states that being is *to be perceived* and (2) requires the existence of a transcendental subject. In contrast, in this account, the object does not depend on the subject. Every object exists relatively to other objects, which is a dependence akin to that of relative velocity – i.e., a physical form of dependence. Moreover, every object is just the thing that is one’s experience of that object. In practice, experience (aka perception) is reduced to existence. Rather than by *esse est percipi*, this position might be summarized by *percipere est esse*, or, more simply, *perceiving is existing*.

Consider, for a moment, a simple existential fact. Whenever we look inside ourselves, we get out in the world. Whenever we think, we think about something besides our thinking process. Whenever we daydream, we see our familiar physical world albeit reshuffled. To recap, *when we look inside ourselves, we see the world outside our body*. The so-called inner world is not inner at all. It is the outside world seen through different causal paths. Our *inner* world is not different in kind from the *outer* world. Both in dreams and in everyday life, experience is made of the same basic stuff, which, in turn, is what the world we live in is made of. Day

in and day out, we walk in one world, which is the physical world. There are no opposed sets of properties. There is no phenomenal red vs physical red. There is just the red of the apple and the way in which such a property is causally connected with all other physical properties. The red of the apple is the property that is, at the same time, an aspect of our experience and an aspect of the apple – experience and apple being two different ways to refer to the same thing. The way in which such a red is causally connected with all other properties and things of the world is what science describes, or strives to describe in the most complete way possibles.

The notion of an inner world, as opposed to the actual physical world, is a myth; it is akin to the notion of a spiritual world or heavens. It is a domain outside of empirical enquiry. It cannot be verified and it cannot make any difference in the physical world; if it did, it would be possible to verify it and it would be part of the physical. The main reason why the alleged inner world has been supposed to be different from the physical world is that nobody had a clue as to where such a world might be in the everyday physical reality. It was not a matter of different qualities and properties, or a matter of positive evidence. It was the offshoot of our ignorance rather than metaphysical insight.

The core of my proposal is the rejection of the separation between subject and object: not because they are two sides of some neutral unity, but because what we have been calling the subject has never been anything but the object. Once the identity between experience and objects is taken seriously, dreams, hallucinations, illusions, and perceptions are no longer mental ghosts but different ways of reorganizing the same underlying unified reality. They must have a place in the physical world. They must be real. In fact, as of here, the rest of the theory is an effort to show how our familiar everyday physical world can be conceptually re-organized. In the rest of the book, I will outline the details of a causal structure of physical reality that is compatible with an unlimited causal reshuffling of the same set of basic objects. We call one such set of reshufflings reality and the rest dreams or hallucinations. However, such a choice is dictated only by practical purposes. It is like the choice of the Earth as the standard reference frame. It is a conventional choice not a metaphysical mystery.

The notion of an inner world is by no means inner due to any positive character our experience has. A dreamed red apple is no less red and round than a physical apple. They have no different character. The notion of phenomenal character has been an invention used to strengthen the belief in a chasm between physical and mental properties. There is no such additional character. There are just the properties of the world that, occasionally, partake in that subset of the world which is one's experience.

To recap, reality is one. Reality is the physical world. Such a physical world is organized by causal processes, which are the only kind of relation nature needs,

into many subsets that carve out the objects we live amidst and are identical with. Each such subset corresponds to a different way of carving nature. Each conscious mind is one such subset. Sometimes, such subsets are well organized and useful and we call them reality. Occasionally, they are not so useful and we call them dreams or hallucinations. In all cases, though, such carvings are ways to organize nature. They are not inner, mental, or phenomenal. They are physical, like everything else. The amount of reality we recognize in an object is proportional to the degree of practical utility that object plays.

#### 4.6 The inner world is outside

Consciousness studies have been biased by the unproven assumption that our experience is somehow inside our bodies or, at least, that it is the offshoot of something going on inside our bodies. A popular philosophical platitude is that experience or consciousness is one's "subjective *inner* life" (Chalmers 1996, xi). Yet, such a notion is unsupported by empirical evidence – if we peer inside the skin, the nervous system, or the brain, nothing like our experience is available. The very notion that our experience is inner and the world is outer is highly questionable.

For one thing, inner to what? What does Chalmers mean when he claims that (*italics mine*, Chalmers 1996, 4): "When we perceive, think, and act, [...] there is also an *internal* aspect; there is something it feels like to be a cognitive agent. This *internal* aspect is conscious experience." Yet, "internal" to what? If one assumed that experience is physical, it should be internal to some other physical object. Yet, no one has a clue as to which physical object our mind should be internal to. If one assumed that experience is not physical, why should one use such a cumbersome attribute ('be internal to')? Is the dualist-immaterial mind internal? Why should it be? In fact, since it is not physical, the Cartesian mind is nowhere. It is not the kind of thing that is located somewhere. Using the notion of internal at face value is a category mistake, at the very least.

It is likely that Chalmers would not agree that he literally means that the mind is inside the head. Yet, during a TedTalk in 2014, he claimed that consciousness is like a "a movie playing inside your head," which is a pretty clear statement in my view. In the foreword to Clark's *Supersizing the mind*, he rules out the possibility that the extended mind case might, in practice, extend to consciousness because of the low-bandwidth connection between the environment and "an internal conscious core." (Chalmers 2008, 6). And so forth. Thus, it is my understanding that there is a widespread belief that consciousness is internal to the head or, at least, that the supervenience basis of consciousness is internal to the head. In addition, it is also somewhat believed that the phenomenal aspect of reality is internal to



the physical world, as though the physical world had an overt and external nature, which is physical reality, and a covert and inner nature, which is phenomenal reality. This too is highly questionable, in my opinion.

Anyhow, the notion of internal is not innocent; it entails a strong physical condition – i.e.,  $x$  inside  $y$ . It is not an attribute that can be used absentmindedly and freely. It brings heavy ontological commitments. I can understand that the molecules of hemoglobin are inside the blood, or that the lungs are inside the chest, and so forth. But I don't have a clue as to what means that experience is inside the mind. The mind should be a physical container, which is absurd? What does it mean that experience is internal? Internal to what?

Of course, one might resort to a purely metaphorical notion of being inside, such as the notion that the number '2' is one of a set of even numbers or that cats are categorized as mammals – i.e., membership. Yet, such a usage is conceptual and abstract; thus, it is only acceptable for conceptual and abstract entities. In contrast, if I referred to something real, and thus physical, and I claimed that it is *inside* something else, I would put forward a more straightforward and unambiguous claim – i.e., that  $x$  is inside  $y$ . The Sun is inside the orbit of Mercury. My cellphone is inside my backpack. And so forth. In the real world, being inside something means being in a spatial location whose boundaries are, to a large extent, delimited by another object. The Higgs bosons that were recorded in 2016 existed inside the Hadron particle accelerator in Geneva. The state of Massachusetts is inside the US. There are, of course, possible exceptions and interesting puzzles, but they do not concern us here. For instance, is a finger inside or outside a ring? Well, it depends on how we choose to use the ring to establish a spatial region – whether the ring delimits the region occupied by the metal only by the volume within the toroid-shaped metal object. In both cases, though, the notion is physically unambiguous.

In the case of the mind, what does it mean that the mind is inside the body and what does it mean that an experience is inside the mind? Both notions are completely obscure. Let's address each of them.

First, consider the notion that the mind is inside the body. Either the mind is physical or it is not. In the former case, the notion is plainly false because we haven't found anything like the mind inside the brain. In the latter case, the notion is meaningless since, as I have argued in the above, it applies only to physical entities. I cannot claim that a non-mental entity is inside a physical entity. The number '1' is not inside my neurons, as it is not inside my stomach. A chewed sausage might be in my stomach, hardly but is the number '1'. Likewise, inside the nervous system, there are neurons, dendrites, axons, neurotransmitters, molecules, ions, and electric potentials; but no numbers, emotions, percepts, experiences, and thoughts. If the mind is physical, and what else might it be, the mind must be like all other physical entities (that's the point of being physical!) – i.e., something



spatiotemporally located, causally relevant, and made of mass/energy. In short, if the mind is physical, we should be able to observe it as we observe muons, apples, and stars. Thus, a serious physicalist who insists on locating the mind inside the nervous system should suggest an observable physical entity that is located inside the brain/nervous system. Yet where? Inside the axons? Between neurons? Inside the encephalic membrane? Where is the place where one's mind hides? The notion is clearly untenable and yet it is routinely employed by both scientists and laymen.

The second notion is equally troublesome. What does it mean that an experience is inside the mind? Once again, if the mind is physical, the notion is empirically unsound. If, on the other hand, the mind is not physical, the notion is meaningless. Is the mind a place like the lungs or the stomach, inside which our ideas and experiences are conveniently stored and piled like apples? It does not seem likely. Is it like a tape or a computer memory, on which traces are impressed by means of magnetic fields? If it were, there should be a screen on which they are transformed back and rendered graphically. Yet, whenever we experience something there is no physical locus inside our body where our experiences are physically brought back to life with their properties. Such a mental silver screen does not exist (Stubenberg 1998).

The notion of an inner mental world, somewhat detached from physical reality, is inconsistent unless one is an unabashed dualist. It can be traced back to the digestive model of the mind that I have previously addressed, speaking of Shoemaker's metaphor of the mind as an ontological dustbin (Shoemaker 1990). In this regard, Shoemaker wrote (*italics mine*, Shoemaker 1990, 110):

It is [...] one of the clichés of the history of philosophy that the problem about secondary qualities first faced in the 17th century was solved, or swept under the rug, by relegating them to the "dustbin of the mind." [...] A dualist can hold that there is no place for redness-as-experienced in material bodies, and nevertheless allow for its existence, by locating it in the non-material realm he takes the mind to be. A materialist obviously cannot do this, since according to him there is no non-material realm. A materialist who does not deny that there is such a thing as redness-as-experienced must allow that there is, after all, a place for this property in the material world. And if he nevertheless agrees with the 17th century writers in holding that such properties are instantiated only in the mind, i.e., as properties of sense-experiences or the like, he must explain *how they can be instantiated in one part of the material world*, namely the neural substrate of our perceptual experience, *if they cannot be instantiated in the parts of the material world in which we seem to experience them as being instantiated*, namely the surfaces of objects like ripe tomatoes.

I quoted this passage at length because it captures nicely the gist of this section. Materialists must suggest a place where such properties as-we-experience-them are instantiated. They have two options: inside the body (the neural substrate) or

“the parts of the material world in which we seem to experience them as being instantiated, namely the surface of objects like ripe tomatoes.” This is exactly where I claim our experiences are. Our experiences of red tomatoes are identical with red tomatoes, and the goal of the following pages is to offer the conceptual tools and the empirical evidence to back up such an apparently preposterous physicalist hypothesis.

Another reason why I quoted the whole passage is that it stresses that the difficulty of finding such qualities in the external world propelled scholars to place them in a conveniently hidden safe, namely ‘in the mind.’ The modern mind emerged as a way to store properties that could not be located in nature. The passage is reminiscent of the famous episode in Tolkien’s *The Hobbit* (Tolkien 1954). Sméagol can’t see the ring and yet he thinks Bilbo has it. Where is the ring? It must be hidden somewhere! But where? It must be inside Bilbo’s pocket! The mind is thus like an alleged pocket where scholars have placed what they were either unable to locate in the body or were too shy to place in an immaterial domain. The notion of the mind is thus like an envelope containing things that cannot be seen. Mental entities are always supposed to be somewhere, but not in the external objects we perceive. They are invisible and thus all the popular models share some excuse to keep them hidden – Bilbo’s pocket, the stomach, and Plato’s cave.

Informally, I suspect that the reason why scholars from different backgrounds have gone to such lengths to justify the fancy notion of an inner domain is the usual assumption: experiences are assumed to be both distinct from external objects and somewhat located inside the body. Since nothing inside the body is like one’s experience, experience must be hidden inside a bodily mental pocket – i.e., the mind.

Yet, if the mind is outside the body and in plain view, the mind will no longer be in dire need of hiding. On the contrary, the mind is the outer world – outer with respect to one’s nervous system. The mind is neither inside nor outside. The mind is something. Reality is not hollow. Reality is ontologically compact – *nature abhors a vacuum*.

#### 4.7 Linguistic boobytraps

The world we live in and indeed our present are actual objects brought into existence by our bodies. An ant will bring into existence a world different to the one my body brings into existence. Bodies do not have any special power. A body is just a physical system that, for a series of contingent reasons, is capable of bestowing complex causal processes and thus, in turn, bringing into existence complex actual objects. Yet, in this account, neither special powers nor emergent properties are attributed to bodies. Of course, bodies are objects too.

In particular, one should avoid the mistake of confusing the body with the ideal/transcendental/cognitive/phenomenal subject that various traditions have postulated. A body is only a physical entity, like a planet, a river, or a pebble – it is not a subject. Therefore, body dependence does not entail any form of idealism or subject-dependence. The object, which is one's experience, has a contingent causal dependence on another physical system, which in our case is, conveniently, our body. *The mind is the world our body brings into existence.*

The confusion between *body*-dependence and *mind*- or *subject*- dependence creeps ubiquitously because of the misleading structure of language. For one, consider Jonathan Cohen's definition of color relationalism (Cohen 2009, 8, italics mine):

The heart of color relationalism is the claim that colors are relational; in particular, the relationalist claims that they are constituted in terms of a relation between (inter alia) objects *and* subjects.

This passage states exactly what I do not defend here. The notion of subject-dependence entails some kind of obscure role for subjects. The subject is the pivot over which classic relational ontologies ground themselves. Of course, dwelling on subject-dependence is a form of disguised dualism. In contrast, I put forward a notion of relative existence akin to the notion of relative velocity. Thus, the object is relative to another object, which happens to be one's body. The subject is not one's body, but the object itself. Thus, the object is not subject-dependent, because the subject *is* the object. The object is the experience of the object. The dependence relation holds between equals and it is the proposed identity between mind and object. In short, the theory presented here proposes a dependence between object and body whereas relationalism suggests a dependence between object and subject. The two stances are radically different.

The apparent common ground is the notion of dependence (being in relation with). Yet, in this account the existence of an object is only relative to another object. Thus, instead of mind-dependence, I defend here object-dependence, which is ontologically more parsimonious and compatible with physics.

Such a confusion is strengthened by language. Consider an apparently innocent everyday statement like 'Stephanie sees an apple' and compare it with other statements of the same kind, e.g., 'the knife slices a cake.'

In the latter case, all terms are physical entities and the action (the slicing) is physical too. The statement refers to something utterly physical. The knife is an object; the cake is another object; the slicing is a causal process in which the knife is the cause of an effect in the cake. Similar statements are 'the Sun scorches the earth,' 'the laser burns the disk,' and 'the hurricane hits the town.' Such statements do not step out of physics. Of course, the terms are vague and often open to interpretation, but, once their reference is clarified, no metaphysical mystery is left.

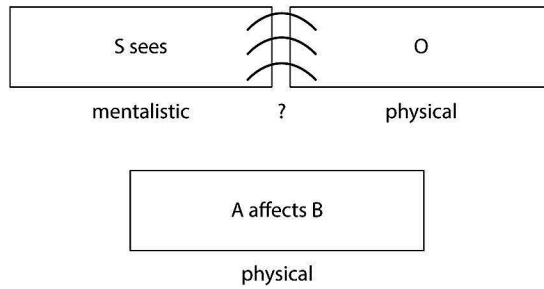


Figure 1. Hybrid mentalistic expressions are a source of mystery

The former case, though, is different. Does the statement ‘Stephanie sees an apple’ imply that something physical has occurred? Not necessarily. While the apple is a physical object, what are Stephanie and the act of seeing? Stephanie is ill-defined. Is it a mind? A flow of experience? A person? The point is that unless one has a purely physicalist account of the mind, the statement ‘Stephanie sees an apple’ is a mongrel; it has a mental side (‘Stephanie sees’) and a physical side (‘the apple’). No deep ontological insight about the nature of things follows from the fact that we use it. The conceptual revision I put forward permits a translation, in pure physicalist terms, of expressions such as ‘I see  $x$ ’.

In everyday language, there are two different kinds of statements. Call them, for lack of better terminology, *physical* statements (‘the knife cuts the cake’) and *mental* statements (‘Stephanie sees the apple’). The mind-object identity theory suggests a way to translate mental statements into physical statements. The statement ‘Stephanie sees an apple’ can be translated into a pure physical statement. Since the proposal is that experience is identical with an object, the statement will become more verbose linguistically but more parsimonious ontologically. The translation, in purely physicalist terms, is something like the following:

The thing we call ‘Stephanie’s experience’ is identical with the actual object (the visible apple) that takes place when a certain stuff produces effects by means of light rays.

While the translation might appear verbose, it achieves an important goal – it gets rid of all mentalistic leftovers. Likewise, one can get rid of linguistic first-person expressions. Sentences like ‘I see an apple’ are even more cramped with dualistic assumptions. They are glorified dualistic attitude stances. ‘I’ is on the mental side; ‘see’ is the arch that bridges the gap; and only ‘an apple’ is physical. Obviously, from a metaphysical and scientific perspective, they are unfeasible ways of formulating perfectly normal situations. They slide towards the mental side by suggesting that

the apple one sees is mental too. Leaving aside this confusion, the physicalist formulation of 'I see an apple' is as follows:

An apple is brought into existence by an optical causal process ending in my brain and originating from some biological stuff on the table. The apple that is brought into existence is of a visual nature to the extent that it is the kind of cause that triggers optical processes rather than mechanical (tactile) or chemical (smell, taste) ones. Without any risk of lapsing back to dualism, such an apple can be dubbed a visual apple.

Statements like 'I see an apple' are verbal shortcuts to say that a visual apple is brought into existence by my body and that, at that moment, the thing that is identical with my experience is the apple. In such a view, everything is physical: the visual apple is physical, my body is physical, and the causal process of optical nature is physical.

The assumption of mental self is so entrenched in our culture that pronouns induce us to mistake them for the corresponding bodies. There are, of course, many good reasons, of practical nature, to do so. If Stephanie utters the sentence "I am in Bogota," it is perfectly reasonable to suppose that Stephanie means that her body is in Bogota. If John and Jane say "we are in bed," we must suppose that their bodies are in bed. Likewise, if Bob is thrown in jail, we suppose that his body is behind the bars. Yet, one can have more freedom in a cell than another person at a party. One's mind can be elsewhere. And one can be lost in one's memories.

The fact is that pronouns stick to bodies and endorse the confusion between bodies and subjects. This is not necessarily the case. Linguistic expressions are practical shortcuts or historical curiosities rather than cues pointing to hidden metaphysical truths. In fact, common language is deeply misleading in these matters. An expression like 'I see an apple' is akin to 'the Sun sets beyond the horizon;' it is a nice historical idiotism without any literal truth.

#### 4.8 There's no distance between experience and world

You stare at, say, the Prudential Tower from the MIT. The tower is more than four miles away from you, but ... wait! Is it really four miles away from you, or would it be more correct to say that it is four miles away from your body? Actually, the Prudential Tower is *inside* your experience, or, better, it is a part of your experience. There is no distance between the Prudential Tower and your experience of the Prudential Tower. They are identical.

In reality, the distance you have so promptly assumed looming between you and the Prudential Tower is the distance between your body and the tower

rather than between your experience and the tower. Actually, no distance looms between our experiences and the objects we experience. No distance at all suggests identity. When you experience the tower, your experience is the tower. This is what experience is. *Our experiences do not touch or reach the external world – they are the external world.*

Again and again, unsuspecting laymen make the mistake of assuming that subjects are where their bodies are. Thus they assume that the distance between objects and *bodies* is the distance between objects and their experiences. It is not.

One might argue that if one destroys the Prudential Tower, your experience will persist, while if one destroys your brain, your experience will not. However, this is not true. On the one hand, the brain is the condition for the existence of the specific object one's experience is made of, in this case the Prudential Tower one perceives from its vantage point, which is different from what other people would perceive from other stances. Thus, from the fact that the destruction of the brain leads to the disappearance of one's experience does not imply that one's experience is in the brain. On the other hand, the destruction of the Prudential Tower at a given time  $t$  does not dispose of the effects that previous instances of the Prudential Tower are still producing. If you destroyed the sun now, the sun would still warm the earth for 8 additional minutes. This fact does not mean that what we see is not a star shining from the center of the solar system; it only means that something can still produce effects after it has been destroyed because such effects are the far-reaching limit of its causal influence. In nature, there are no temporal thresholds to limit how much later an effect can occur.

Let's elaborate further this case. Emily reads a novel on the beach. She looks around. She perceives a few sunbeds, people sunbathing, the sea, the blue of the sky, a few clouds, and the Sun. All such entities are at different distances from her body, but are they far off from her experience? No, they are not. The Sun is as much close to her experience as the nearby sunbeds. Both the sunbeds and the Sun are pieces of what she calls her world, which is also her experience. The objects that compose her experience are all at the same distance from her: none. They are at different distances from her body, though, which is neither her nor her experience. They are as many parts of her experience. Of course, they are at different distances from her body. The Sun is at a distance of 150 million kilometers and the sunbeds are a few meters away.

If there were any distance between experience and objects, they would be separate. A physical gap is a recipe for a metaphysical and ontological gap. A physical separation implies numerical difference, and thus it implies two separate things that cannot share their own properties. After all, in traditional mind-brain identity theories, there is no distance between experience and the corresponding brain pro-

cesses. Identity entails no distance. In the case of the mind-object identity theory, the consequence is less intuitive because we assume we are where our bodies are.

A skeptical reader might rebuke that I have not addressed the issue of the relationship between our experiences and our bodies? But I did. My body is the object that brings into existence the object that is me. Such an object can be as simple as an apple or as complex as the composite set of all spatiotemporally scattered things that are my present at a given time. Such a spatiotemporally complex object is the thing that my experience is. The fact that it is spatiotemporally spread should no count as an objection since all conceivable physical objects are spatiotemporally spread, neural activity included. Thus, if neuroscientists of internalist tendencies can live happily with a *spatiotemporally spread* neural activity, why shall we be worried by a *spatiotemporally spread* external object?

What makes my body my body, given that I claimed we are not our bodies? The fact that my body is the object that brings into existence the object I am. Thus the particular body I am familiar with is the very thing in the universe that it is necessary to the existence of the object I am. It would be a misunderstanding to rebuke that when one looks at an apple, it changes from being an apple to being both the very same physical apple and an experience. The apple is just an apple. It is not both a physical apple *and* a phenomenal apple. It is just a physical apple. My experience of the apple is the physical apple that takes place because of my body, which is just an apple.

Different bodies, say my body and yours, bring into existence different apples from the same stuff although such apples have enough in common to be cozily handled as they were the same apple. If this plurality of apples may sound counterintuitive, consider the case of velocity. If you and I swim at different speed with respect to a buoy, such an object will have two different relative velocities – one for each of us. Yet, this does not imply that the buoy has a *real absolute* velocity and *two subjective* velocities. The buoy has two relative velocities which are both real and physical. When a third swimmer arrives, the buoy will have a new relative velocity. And so forth. Each body brings into existence a new apple, tantamount to how each new swimmer instantiates a new relative velocity.

I am aware that it is extremely difficult to overcome the life-long habit of conceiving ourselves inside our bodies, yet a skeptical reader should concede that it does not really contradict anything. *Experience reaches the world because our experience is already there; our experience is the world we experience.* All models that imply some stretching from the body to the world or, alternatively, some swallowing of the world, are doomed conceptually and empirically. The only solution is to admit that experience is the world and that *there is no distance between our experience and the world we experience.*

The lack of any distance captures the gist of what I would like to call the fullness of existence – namely the fact that nature is ontologically compact. We can't experience anything outside of the stuff nature is made of. Our experience of reality is one with a reality that leaves no ontological gaps. The notion of space is an attribute that describes and individuates entities. It is useful and it expresses how things are arranged in nature. Thus it is real. However, space is not an ontological void. The notion that our experiences are *here* and the objects they refer to are *there* is a category mistake. Experiences and objects are one; they are identical both numerically and metaphysically – no distance holds between mind and world.





## CHAPTER 5

### The actual object

*Anything which becomes the same with the many, necessarily becomes many and not one.*  
(Parmenides)

The mind-object identity theory requires a revision of the notion of physical object. If the main claim is that experience is one and the same with objects, we need to clarify what an object is. Objects must match both the causal/functional description of physics and the everyday experience of the world we live in. Traditional objects are the building blocks of what I previously referred to as naïve materialism. Since they are unable to cope with everyday experience, the notion of traditional object elicited the invention of the immaterial mind. Traditional objects are (1) absolute, (2) exhaustively describable in physics-alist terms, (3) largely independent of time, and (4) causally impervious. By causally impervious I mean that causal relations are extrinsic to what an object is. In contrast, the object I will flesh out here, which I will dub *actual object*, is (1) relative, (2) physical, (3) temporally blossoming, (4) causally constituted.

The proposal should not appear earthshattering. In fact, the notion of an actual object is consistent both with our experience and with our scientific worldview. We live in a causal world and our experience is causally embedded with all the rest. If our experience is the object that takes place, everything adds up! There is no more need for any non-causal, epiphenomenal, phenomenal or representational layer.

Of course, as it happens, the notion of an actual object will require some adjustments with respect to commonsensical views. However, such adjustments do not pose any consistent obstacle and, as a bonus, are so ontologically parsimonious that actual objects will fit comfortably inside the physicalist playground.

The key notion behind the actual object is that the actual object is a cause of some further (and distinct) occurrence – it has a causally relative existence. The actual object is a cause, contingent and actual. It is a causal token. Each actual object is a cause of something that has happened. It is a cause only if an effect has occurred. Thus, it comes into existence as a result of the occurrence of its effect.

The emphasis on contingency and actuality is paramount. The actual object is contingent because it does not imply (and nor does it have to imply) any type-type

causal connection. While it would be cozy if type–type causal processes defined the normative structure of nature, the actual object is not committed to any lawful manifold. The notion of actual object does not require the establishment of a causal law among certain kinds of events and certain kinds of effects. It is enough to assume that each actual object is the cause of some further occurrence. *The essence of existence is causation*, so to speak.

Such a dependence on actual causation is consistent with our everyday experience. In fact, *everything we experience is something that has a causal effect either on our body or, at least, on something else that, in turn, has a causal effect on our body*.

Furthermore, the same dependence is also consistent with the scientific worldview insofar as everything must be measurable and thus must be the cause of an effect. Any measurement requires a causal process. If something had no effect whatsoever, it couldn't be measured. It would be causally extraneous to the physical world that science strives to comprehend. Later, I will show that the link between measurement and causation makes it possible to debunk the subjective/objective dichotomy.

Are all objects causally active? Yes, they are. Causation is intrinsic to what an object is. Whenever we refer to something – say, a red apple on the table – the thing we refer to is the thing that is affecting our body. By means of light, chemicals diffused in the air, and pressure on our fingers, the apple affects our body. The apple is an actual object. There are occurrences inside our body that are the effects of the apple. Even apparently static objects affect our body. The still apple on the table is causally active! If such a causal presence did not obtain, the apple would be invisible, undetectable, evanescent, diaphanous, and immaterial ... in the end, it would not exist.

The world is made of causally efficacious entities – i.e., objects are always contingent causes of further events. This should be rather uncontroversial, since everything that is part of our experience has a responsibility to produce some perturbation – otherwise we would be completely unaware of its existence.

Something exists insofar its effects take place. If entities were altogether incapable of producing any effect, such entities would be completely inconsequential and, to all extents, immaterial (pun intended). Physics admits only entities that have an actual existence – i.e., that produce measurable effects. All experiments and measurements are based on the assumption that the target entity/property is producing a causal difference in the world.

Quantum mechanics and physics are committed to actual entities. When astronomers recorded trajectories of galaxies that could not be explained by relativistic gravity, physicists took into consideration the existence of dark matter – such trajectories were effects in search of proper causes. Thus astrophysicists introduced a missing cause – namely dark matter – to explain the

unfathomable. By the same token, in 1844, Urbain Le Verrier noticed perturbations in the orbit of Uranus and supposed, correctly, that the cause of these effects might be an unknown planet. At the Berlin Observatory in 1846, on the night of 23 September, the astronomer Johann Gottfried Galle found Neptune. Effects demand a cause.

All of this should be quite obvious, but in philosophy of mind and neuroscience many scholars have courted the notion that consciousness might be the kind of thing that does not produce any effect. This is both incongruous and false. It is false because we all know that whatever our experience is, it is the cause of effects. While many findings have questioned such a fundamental insight (Haggard 2009; Haggard 2011; Soon et al. 2008; Haynes et al. 2007; Libet 2004), they have one shortcoming – they do not know what, where, and when experience is. Moreover, the problem of mental causation is likely to be an offshoot of the assumption that the mind is distinct from the material world – their causal efficacy conflicts panel leads to causal overdetermination. If consciousness were epiphenomenal, why and how could it have been singled out by natural selection? Grouch and its club strike again!

Anything we perceive must be the cause of something. Thus our world is the world of actual objects. Here, I won't need to delve into the quicksand of the existence of causally inert entities – say, transcendental platonic ideas. In fact, they are unsubstantial to me and to everybody else I am in contact with and everything else I may get acquainted with. My world is the world of actuality. The world I am familiar with is made of actual objects. Of course, conceptually I can split existence from causality, but I can do it neither in the world I live in nor in my experience – the two domains being the same.

To recap, the only objects I am and can be familiar with are actual objects; the only objects science can be familiar with are actual objects; the only objects I need are actual objects.

### 5.1 Actual objects vs naïve objects

At this stage, a very likely objection is whether the object – the apple on the table – is really one and the same as experience when I look at the apple. Do the apple and my experience have the same properties? Since Galileo's time, the standard reply has been negative. However, I believe that a positive answer can be defended. I will split the reply into two halves. On the one side, I will address the properties of the object. On the other side, I will address the properties of the experience.

As regards the object, one should distinguish the *naïve* object – also called the *ideal* or *traditional Galilean* object – from the *actual* object that one experiences.

The naïve object is an abstraction that is tremendously useful in science and accounting but that no one ever gets acquainted with. Such an object is like the notion of center of mass – useful but immaterial. It is akin to what Whitehead called the fallacy of misplaced concreteness (Whitehead 1925). Conversely, the actual object is the object one grasps, sees, smells, and eats. It is something that always begins and ends inside an actual causal interaction. Let me anticipate an observation. The objects one perceives are made of those very properties that are causally coupled with one's body. For instance, the apple on the table is undoubtedly emitting infrared. Yet, I am blissfully unaware of such additional radiation and – as regards the apple I see – infrared is immaterial. The apple I perceive does not emit infrared. In other words, the object my body brings into existence is *the object made only of those properties my body is causally affected by*. Nothing else is required. Other physical properties (infrared, neutrinos, hidden features) are simply not part of the (actual) object I experience. They are part of a naïve ideal object nobody has everseen.

The object I experience is not the ideal object that science courts. It is only the object my body interacts with. It is an *actual object*. Actual objects are all we need. In fact, whenever we interact with an object, it is an actual object. It is the object that is singled out by the particular causal interaction our body allows to take place. The traditional objection that the apple has properties that the experience of an apple lacks – such as being edible, being of a certain mass, having a weight, coming into existence at a certain time – is not effective since such an alleged apple is the naïve apple. It is neither the actual object nor our experience of it. The object I perceive is made only of those properties that partake my experiences. *The object I perceive is the actual object, not the naïve object.*

Occasionally, for practical reasons, it is useful to lump together several actual objects into an ideal big bundle of properties. Yet, that is neither necessary nor always possible. For instance, consider the *Mona Lisa*. The *Mona Lisa* has, of course, a certain mass and thus a weight. Yet, no one – but Leonardo and a very small group of art historians – has ever experienced the *Mona Lisa's* mass, which is, as regards the object everyone sees at the Louvre, utterly immaterial.

On the other hand, even the most complete account of an object surely misses some outlandish physical property that only some esoteric causal circumstance might bring to life. For instance, does my familiar apple have any commerce with dark matter? It does not. As a matter of fact, nobody feels the need to go to such lengths to describe the object. The standard scientific object corresponds to a parochial list of physical properties as they usually take place in human environments. Such a list is never complete. In contrast, the actual object is, at any time, an actual cause. It is not a subset of the ideal object, nor is it a temporal part of an object. It is a causally – active physical entity.

The notion of a naïve object, which I believe is not far from that of a commonsensical object, is akin to that of a center of mass or a meridian. It is an abstraction that underpins useful epistemic shortcuts. However, it can't be fully grasped because it would require an infinite list of causal properties, whose determination is beyond concrete scientific practice.

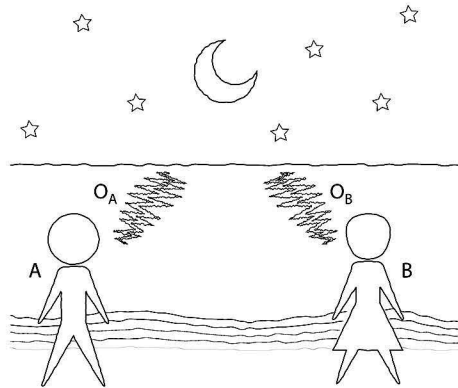
The actual object exists because of the contingent causal circumstances offered by our bodies. If our bodies were not in a certain place, a given actual object would not occur. Other objects would occur, of course. Yet, those very objects that compose our world and our experience would not. The link between bodies and objects is paramount since, if our bodies did not exist, such objects would not exist either. Yet, our experience is not our body. Our experience is a collection of external actual objects.

The actual object is whatever exists because of the causal circumstance offered by our body. *Whenever our body is in one location, the physical world takes place in a certain way, and thus certain actual objects are singled out.* The actual object, though, is neither a mental entity nor something inside our body. The actual object is a real, physical object, located in the external world, causing a causal process that affects our brain and requires our body to reach completion. Likewise, when our body is in a certain place, a certain causal process flows, and its cause pops into existence as a distinguishable whole – the cause being the actual object. Effects single out their causes.

Do objects exist when our body is not there? A useful analogy is offered by the fridge light. We never see the light off. In the case of the actual objects that compose our everyday world, the equivalent of the open door is our own body. The actual object is like the fridge light. Whenever we open the fridge door, the electricity flows and the light is switched on. As a result, whenever we check whether the light is on, the light is on. Of course, thanks to our understanding of the fridge's structure, we know the light is not always on. Whenever our body is at some place and sets a causal circumstance, the causal process occurs from a subset of the physical continuum to the body. As a result, whenever our body is present, the object occurs as well. When our body is not present, reality is different; physical reality.

The causal nature of actual objects is particularly manifest in all cases in which the existence of the actual objects depends on easily modifiable properties of the observer body – rainbows, short sight, reflections and the like. For instance, consider Riccardo and Chiara looking at the sea at night (Figure 2). The full Moon shines in the sky and a silvery stripe runs from the horizons up to the observer's feet. Since there are two observers, A and B, each of them will see a slightly different stripe. As the figure shows, the two stripes will be two different portions of the sea,  $O_A \neq O_B$ . They will be physically different. Each of them will exist because

a body will provide the right causal circumstances. Potentially, the sea surface is shiny in the same way everywhere. However, only God (so to speak), might see all stripes at once. A human body singles out only one stripe at a time – the stripe that is one and the same with one's experience.



**Figure 2.** The stripe of the Moon on the sea is an obvious case of relative object. Each human body singles out a different stripe of the moon.  $O_A \neq O_B$

$O_A$  exists only relatively to the causal circumstances offered by A's body. By the same token,  $O_B$  exists only relatively to B's body.  $O_A$  causes effects in A and such effects in A bring  $O_A$  into existence ( $O_A \rightarrow A$ ). The stripe on the surface, like many other optical phenomena such as rainbows and halos, is a very convincing case because it depends on the observer's position which can be easily modified. One moves and the stripe (or the rainbow) changes. Yet, such phenomena are only the tip of the iceberg. If one might change other properties of one's body as easily – for instance the structure of the retina – one would see a different world because the world one would select would be different. In other words, if one changes the body position, one changes the causal circumstances that allows a given object to take place. Consequently, the previous object does not occur and another one does. If one might change other body properties, the same would happen. The body sets certain causal circumstances and, in turn, corresponding objects occur.

The notion of the actual object does not endorse any form of idealism, as the notion of relative velocity does not do either. The actual object is relative to another object rather than to a subject. The only dependence is causal dependence between physical objects. Everything is physical and everything that is physical is intrinsically causal. The proposed identity theory does not require any appeal to mentalistic notions. In fact, the claim that one's experience is identical to the object that is the external physical cause of one's neural activity does not mean that the apple is pulled into existence by the experience. The apple, as with

every other object, comes into existence because the right causal circumstances for an apple to take place obtain. As it happens, such causal circumstances are embedded in one's body. Thus, the actual object, which is at once the external object and the thing usually called 'experience,' takes place whenever one's body is next to certain physical conditions. Coherently, a given actual object does not exist unless the right body is available. *The actual object is body-dependent; and thus object-dependent rather than mind-dependent.* So much for the accusation of idealism.

A final caveat. Here bodies have no special ontological status. They are just the objects we are very interested in for opportunistic reasons. A body is just yet another object.

## 5.2 Existence and causation

I am not the first to pinpoint the deep connection between causation and existence, which can be traced back to Plato himself (*Sophist, Parmenides*), where Socrates states that something that exists is something that produces effects. Leaving aside the ancient Greeks, in more recent times, the standard reference is an admittedly rather vague passage by Samuel Alexander that eventually became known as Alexander's dictum (Hudson 2003; Cargile 2003; Elder 2003; Kim 1993a; Kim 2005; Kim 1998; Kim 1993b). The passage reads (Alexander 1920, 2:8):

[Epiphenomenalism] supposes something to exist in nature which has nothing to do, no purpose to serve, a species of noblesse which depends on the work of its inferiors, but is kept for show and might as well, and undoubtedly would in time, be abolished.

Thus, the notion of causally inert existence is presented as a form of noblesse that will eventually be abolished. Existence, thus, is not compatible with epiphenomenalism. Jaegwon Kim summarized such a view by stating that (Kim 1993b, 202):

To be real is to have causal powers. I believe this principle, as applied to concrete existents and their properties, will be accepted by most non-reductive physicalists.

In Kim's reading, Alexander urged "that to deprive something of causal powers is to deprive something of its existence" (Kim 2005, 159). In fact, Alexander's dictum, together with other germane notions – such as the argument from causal overdetermination – suggests a deep relation between causality and existence. Many authors (Merricks 2001; van Inwagen 1990) have suggested a deep connection between causality and ontology. For one, Trenton Merricks' Eleatic Principle stated that "for macrophysical objects, to be is to have causal powers" (Merricks 2001, 81).



All these authors have stressed the same insight: existence as we know it requires causality. *The fee to exist is to be the cause of something*. Causality carves out both our experience and the world we live in – the two being the same.

If existence requires causation and causation is contingent, until an effect is consumed, *the existence of the cause is not set*. Such an apparently paradoxical conclusion marks a difference with Kim's approach. In fact, Kim speaks of causal powers that might be intended as dispositions. Here, the notion of actual object does not require any dispositional attitude.

In fact, the mind-object identity theory abhors anything that is neither empirically verifiable nor causally active. The notions of dispositions and causal powers are suspicious because they are supposed to be there even when nothing happens. They are ontological booby-traps waiting to snap. I will argue against anything like that on the basis of two arguments. First, causal powers are uncountable and infinite – everything has all conceivable dispositions as long as the right circumstances are realized. Second, the instantiation of actual properties depends on external circumstances and thus it cannot be a property of the object alone.

The first argument is straightforward – let's dub it the infinite dispositions arguments. In principle, it states that, given an arbitrary object and an arbitrary disposition, it is always possible to envisage the right causal circumstances that provide a given object with a given disposition. Is a scrap of metal a key? Yes, it is as long as I build a device, a lock, that can be unlocked by that piece of metal. Is that scrap of metal a thermometer? Yes, it is, as long as I am able to see the tiny changes in the metal's volume due to temperature variations. Is the same scrap of metal capable of exerting a pull of 10 tons? Yes, it is, as long as I place it nearby a giant planet with a mass hundreds of times that of the Earth. And so forth. Of course, one might argue that to possess such dispositions the scrap of metal requires other stuff. Yes, of course it does. This is true, though, for any disposition. Yet, it is not the point. The point I want to more is whether something has its own dispositions. Absolutely and clearly it doesn't.

This leads to the second point, namely that dispositions are always relational and actual/contingent. It might sound strange to stress that a disposition is of a relational nature. Yet, the exact nature of a disposition depends on the contingent set of circumstances relative to which it can exert its power. A does not hold the causal power *p*. A has *p* only relative to B. A, B, and *p* are not separate entities. In the previous example, A is the scrap of metal, B is the lock, and *p* is keyesque disposition. In other words, a disposition depends on the actual causal process that occurs. Thus the disposition is ontologically redundant because the causal process is all we need. There is no ontological booby-trap. In given circumstances, a causal process occurs and such a process carves out its cause. The disposition is the redundant *a priori* power it has been assumed that an object/event possessed

before being engaged in a given causal process. Yet, all of that is, to all extents, gratuitously complicated. We can set aside the notion of disposition (as we set aside the notion of absolute object) and consider a much simpler ontology – *token causes and token effects*. Causes are fixed by the occurrence of their effects, whenever such effects take place, contingently.

The notion of absolute disposition is analogous to that of absolute object. They are both like that of absolute space and velocity, remnants of a bygone age. Since the occurrence of the effect is contingent on whatever circumstances are needed, one can never be sure the effect will occur. Thus, *the existence of the cause is uncertain until the effect sets it*. Such a conclusion should not bother us excessively. In fact, as mentioned above, inside the universe we live in, all causes are actual causes. Whenever something is part of nature, it is because it has produced an effect. It has paid the fee to exist. There are no stowaways on board in nature. The notion of a cause without a corresponding effect is a metaphysical fancy or, to use Alexander's words, a noblesse to be abolished. Amazingly, there is evidence that effects fix their causes at an astronomical scale (J. A. Wheeler and Zurek 1983; Halliwell, Perez-Mercader, and Zurek 1994).

In practice, though, causes and effects always come in pairs and, a bit like magnetic poles, cannot be methodologically split. Their mutual dependence is not a nuisance but rather the expression of some fundamental structure of nature. In the form of a slogan, *effects bring their causes into existence*.

An example will help to clarify the matter (Figure 6). Suppose there is a group of seven stars scattered in space and time. They are the seven stars that, when seen from the Earth, are named the Great Bear or Ursa Major. Such stars emit light in every direction. Do they produce an effect as a whole? So far, they do not. Their light rays proceed in every direction and travel through empty space. For the sake of the example, let's suppose that no other planets or stars are around. Then, after billions of miles, by contingent necessity, a planet is hurtling through the void and it happens to be in the exact right spot where seven light rays, each from one of the aforementioned stars, converge. In that very point in space, where such light rays cross paths, a human eye is placed in the right direction so that the seven rays enter its pupil and smash against its retina – a biological structure of a few square millimeters. The interaction with the retina triggers a cascade of further neural effects that culminate into a joint effect. For instance, the body of the beholder – call her Emily – utters “I really like Ursa Major”. Thus, at that very moment, and not before, the existence of the cause – namely the constellation as a whole rather than the seven stars – is brought into existence. Emily's body brings the constellation as a whole into existence – *Emily's body and not Emily*. The occurrence of the effect is contingent and it might have been hampered by many unexpected events. For instance, Emily might have been delayed by a plumbing problem in her apartment.

Or, more apocalyptically, the Earth might have been shattered by an asteroid just a moment before. If that had been the case, the seven rays would have missed their only chance to produce an effect as a whole and the constellation would not have existed. If you think about it, the odds that after so many years the constellation will produce an effect is abysmally small!

Emily's body brings into existence the constellation as she perceives it, not the stars. Nor it brings into existence the constellation as a traditional object but only the constellation as it exists relatively to Emily's body.

The fact that Emily's body brings into existence the constellation as a whole is not an admission of idealism. In fact, as stressed, I have been careful not to write 'Emily brings.' Rather I wrote 'Emily's body.' The difference is paramount since my account does not allow anything but physical entities. Thus, the existence of the constellation is object-dependent and not mind-dependent. In this case, the object is Emily's body, which does not pose any idealistic threat. Emily's body, no matter how beautiful, is just an object with physical properties.

Emily's case shows that the existence of an entity hangs in the balance, dependent on the occurrence of a corresponding effect. Effects carve out the ontology of the world by singling out the causes that produced them out of countless possibilities. Effects fix the actual ontology of the world rather than the potential ontology the world might have had. Colloquially, effects extract the ontological winning lottery tickets.

### 5.3 The joint cause

A crucial issue is the relation between wholes and parts. In fact, here there lies an apparent chasm between experience and physical reality. On the one hand, experience seems to be composed of macroscopical and discrete entities – an apple, a face, a tune, a word, or a constellation. On the other hand, physical reality seems to be pulverized into a cloud of atoms (or smaller entities). In fact, in science and ontology, there is the widespread conviction that micro-stuff drains off all causal powers and macroscopical objects are epiphenomenal side effects of the way in which we describe reality. The main argument is that of causal overdetermination (Merricks 2001, 79–80):

If an alleged effect of an (alleged) object is caused by that object's parts, and if that object is causally irrelevant to whether its parts cause that effect, then that effect is – assuming no overdetermination – not caused by the object in question.

Clearly, the argument of overdetermination is an offshoot of the existence-causality principle outlined in the previous section (Alexander's dictum). Based on causal

overdetermination, many authors have claimed that macroscopical entities are not as real as the micro-stuff because they have no residual causal role. Merricks' application of the overdetermination argument seems to get rid of familiar objects (Merricks 2001, viii):

I deny the existence of inanimate macroscopica – statues, baseballs, rocks, stars, etc. – their problem is not that they are inanimate. Their problem is, among other things, that were they to exist, their causal powers would be at best redundant.

Since all the causal responsibility is allegedly drained by the simples constituting an object, there is no causal job left for the object itself. Thus, objects would not exist. If Merricks' overdetermination argument and, to a certain extent, van Inwagen and Kim's arguments were correct, it would follow that our experience of the world is completely mistaken. We would live in a massive illusion (or, at least, in a massive delusion). All the household objects we believe in – apples, cars, and stairs – would not exist. They would be an illusion. Is this truly an ironclad conclusion? I suspect that it might be a self-defeating claim. In fact, if it were true, what would be the cause of such a massive illusion/delusion? If nothing else, objects must exist as the cause of such a massive delusion. Yet, if they were the cause of the delusion, they would exist and thus they would no longer be a delusion.

Fortunately, I believe there is a simple solution to this worrisome issue – in certain (common) circumstances, macrophysical causes (macrophysical objects) are not overdetermined by their parts. In such cases, there is no overdetermination and thus macrophysical causes are not epiphenomenal – they exist. What are these circumstances? They are cases in which a collection of simples produces a joint effect, namely something that could not have happened if any of the simples had not occurred.

The simplest case I have in mind is that of an electronic implementation of an AND gate. You have two inputs and *both* are necessary for the output to occur. I will return to such a case later. Another case I have in mind, and I believe it is not just a coincidence, is the familiar sigmoid function that implements a sort of biological AND gate in neurons. In all such cases, we have a multiplicity of possible causes and a causal bottleneck that allows the output to take place only if all causes occur. If all causes occur and a joint effect takes place, a new cause must have occurred – the whole. In brief, "The many become one, and are increased by one" (Whitehead 1929, 21).

Thus, in this sense, animal bodies – and human bodies in particular – have some unique structures that might be responsible for the occurrence (and thus the existence) of a large proportion of the objects we are familiar with. Yet, such a whole-generating role is not a special metaphysical power, but the result of the proper physical structure, countlessly repeated and modified. If one were skeptical about joint causes,

one could always appeal to the existence of an unlimited number of objects and the fact that each of us is identical to a limited subject. In this interpretation, joint causes select the reality our experience is made of. There is no metaphysical mystery.

As a working base, consider all the tokens of the particle type in the standard model of matter. I deal exclusively with the simplest form of the special composition question (van Inwagen 1990): under what conditions do concrete simples add up to form a concrete whole? My answer to the special composition question is that:

the simples compose a whole if the simples are the joint cause without the redundancy of an effect.

In the literature about the ontology of wholes, there are three possible kinds of answers: unrestricted composition (any possible whole exists), no composition (there are no wholes and thus no macroscopical objects), and restricted composition (certain wholes exist, but which?). The proposed solution is a case of restricted composition. Unfortunately, restricted composition has often been accused of being vague (Lewis 1986, 212). Yet, in this case, I don't see any reason for concern. Either the proposed circumstances hold or they don't. Consider the case of the Ursa Major constellation. Either the light rays meet in someone's eyes on some planet or they don't. Either their causal paths interbreed to give birth to a further event, a joint event, or they don't. There is no vagueness here. This is not to say that it would be easy to predict whether they will interact to form a new event. Nor would it be easy to set general laws for such an occurrence. Yet, once they cross, a joint event happens. As a result, there must have been a cause of that event. Such a cause – call it the joint cause – is not overdetermined by any of its parts. In fact, the stars may have occurred separately without the constellation ever occurring. Thus, the stars (the parts) do not overdetermine the constellation (the whole).

In the case of the AND gate, the parts (the inputs) do not overdetermine the whole. Until the final joint effect occurs, the whole has never occurred. For a while, the inputs produce effects that are largely independent from each other. Thus, the two inputs are different from the whole insofar as they produce different effects. Eventually, though, their joint occurrence produces something whose cause is neither of them. Such an effect brings into existence the whole at the inputs of the AND gate. No matter how fine-grained our analysis of the causal process is, there is always a moment after which something is the joint effect of *all* input events. The occurrence of such a joint effect brings into existence a whole that is different from the sum of all input events. Of course, the causal process from the inputs to the gate output is due to many factors that are physically distinct and separate from the occurrence of the inputs. For instance, some unexpected event might take place right before the occurrence of the final output and hence the joint effect – and the joint causal process – would not occur.

Why are the inputs,  $x$  and  $y$ , different from their joint occurrence,  $x$  joint  $y$ ? Basically,  $x$  and  $y$  can occur without the final output taking place. If the output were pre-empted,  $x$  joint  $y$  would not occur. To put it Elliottesquely, the whole “would remain in a realm of possibility.” Many circumstances can be envisaged in which  $x$  and  $y$  take place while  $x$  joint  $y$  does not. The whole is not overdetermined by its parts. Since there is a delay between  $x$  and  $y$  and  $x$  joint  $y$  something can always happen to prevent  $x$  joint  $y$  from occurring.

For instance, if the AND gate were not working properly, each input might produce an effect of its own. In a contingent world, the occurrence of the inputs does not necessarily entail the occurrence of the whole – i.e.,  $x$  joint  $y$ .

The latter argument raises an issue I won’t exploit fully here: how do we know that something has parts? This happens because we are able to detect effects caused by incomplete aspects of an alleged whole. It is interesting to mention the epistemic opacity brought about by joint causation. In fact, a causal process producing a joint effect hides all the components that produced it since its cause is not the components, but rather the whole.

The joint cause/joint effect reply to the special composition question defeats the overdetermination argument for objects. All the objects we experience are joint causes – wholes – that exist as wholes thanks to the joint effects occurring inside our bodies. The causes, though, remain outside the body. The body offers the correct causal circumstances for the existence of the objects that our world and our experience – the two being the same – are made of.

## 5.4 Relative existence

The existence of an actual object is not absolute, instead, it is relative to the occurrence of a proper effect. Such a dependence is key to sidestepping the overdetermination argument that jeopardizes the existence of macrophysical objects. The notion of relative existence applies not only to macrophysical objects, but to everything else as well (simples included). As previously mentioned, such a principle – a restatement of Alexander’s dictum – should not worry too much. Both in science and in everyday life, everything we deal with is causally efficacious and thus relative to an effect.

In contrast, the traditional notion of the object (the Galilean object) is absolute. In this regard, the notion of the Galilean object is akin to the notion of absolute space – something that has currency neither in our everyday life nor in the scientific description of reality. In fact, the ideal object is something we never encounter, not only in our individual experience, but also during scientific practice. The ideal and absolute object is a useless hypothesis.

First, as mentioned before, whenever an object is part of our experience, such an object has had a causal role. The same fact holds for measured properties. It is impossible to interact with causally inert objects and properties.

Second, the notion of an ideal object should encompass all possible physical features – an impossible feat. Many such features, in fact, are neither known nor accessible to us. For instance, take our familiar apple. What are its features? Shape, weight, texture, taste, smell. Are they enough to circumscribe the ideal object? Of course not. In fact, the ideal Galilean apple should also have properties that are not usually mentioned – electrical resistance, impedance, magnetic capacity, level of radioactivity, but also neutrinos opacity, dark matter interactions, and more and more exotic properties. Yet, such additional properties are neglected because they are not among the features that play a causal role relative to human bodies. *The Galilean object is the horizon we never reach; the actual object is the ground where we stand. The Galilean object is not a real entity, but an abstraction.*

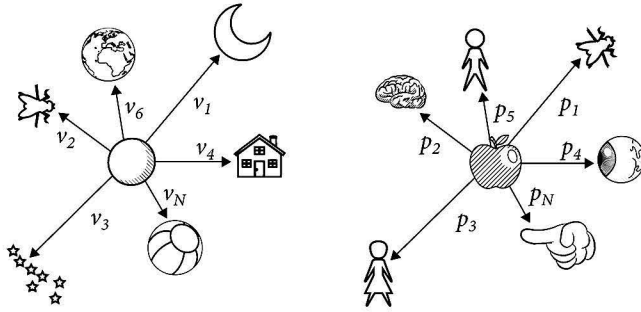
Yet, the existence of such an object has no role in our life. Every time an object partakes in our world, it does so because an actual object is having causal intercourse with our body.

Overall, the absolute object is a transcendent object conceived from a God-like perspective. It contains an infinite list of physical properties, most of which no one has a my clue about. Thus, it does not resemble the parochial notion of the object that one might have. It would be something completely different from anything we have ever seen. In fact, the layman's idea of the object is irredeemably parochial insofar as it is made of only those features that are causally active thanks to human bodies.

The proposed principle – a restatement of Alexander's dictum in contingent and causal terms – is that *everything exists relatively to something else*. Such a principle does not require the introduction of relations as additional ontological characters. We do not need relations. There are just objects that take place relatively to joint effects, which are nothing but other objects. We are fully inside physics.

A remarkable analogy is represented by germane notions such as relative vs absolute position, relative vs absolute orientation, relative vs absolute velocity, relative vs absolute time, and so forth. In antiquity, orientation, position, and velocity were taken to be absolute. The notion that at this very moment on the other side of a spherical Earth there one people turned upside down with respect to us was a cause of endless wonder. Or, consider velocity – an object was either still or in motion, *tertium non datur*! It turned out that things were not that simple. Since Galileo's theory of restricted relativity, every schoolboy knows that there is no such thing as absolute velocity. If one asks what the velocity of a body is, the correct reply is that the question is meaningless. Rather, one ought to ask what is the velocity of a body *relative* to a reference frame? Since there are infinite reference

frames, every object, at any moment, has umpteen *relative* velocities – i.e., everything has umpteen velocities. It might sound strange to the layman, but the red apple that lies still on the table is, at the very same moment, moving in all possible directions at all possible speeds.



**Figure 3.** Every object has umpteen relative velocities at any time. Every object has also umpteen relative properties. As there are no absolute velocities, so there are no absolute properties

The notion of relative velocity, which has been around for four centuries, required a revision of the commonsensical notion of velocity. Yet, it did not destroy physics, nor does it worry the layman. Likewise, the notion of the relative existence of objects should worry neither the layman nor the physicist. Every part of the physical continuum might give rise to umpteen different objects relative to a different object. Thus, the same part of nature might be a red apple to my body, a weight for the table on which it lies, an obstacle for William Tell's arrow, or a comfortable home for a worm. Here I have been careful not to mention any subject. Here, I have listed only physical systems – my body, the table, an arrow, and a worm. This is paramount because I do not advocate any form of mind-dependence (or subject-dependence) that would lead to idealism, circularity, and epistemic disaster. The dependence is with other objects that offer the right causal circumstance for that particular object to take place, everything else being the same.

The kind of *relative existence* I defend here is of contingent and causal nature. It is not an abstract relation. In other words, an object is what it is relatively to an effect that occurs somewhere and at some ensuing time. Until the effect has not occurred, the object will not exist – nor would it make any difference if it did. This formulation is different from the traditional notion of relative velocity, which suggests a relation with an abstract reference frame: “velocity properties are relational [because] velocity properties are constituted in terms of relation to reference frames” (Cohen 2009, 154). In the case of actual objects, an abstract reference frame would not suffice. A concrete physical system and the occurrence of effects are required. In this sense, it is meaningful to use the term actual object.



In many relationalist accounts, the existence of something, say colors, is relative to something else (for instance, Cohen 2009, 27). Relationalism does not explain why a relation should constitute anything or what is a relation in the physical world. As a matter of fact, relations are often abstract or logical, such as *being a sister*, or *being 50 meters to the left of a philosopher*. Most relationalists do not put forward an empirically falsifiable hypothesis but unfold a conceptual schema, which is useful but empirically diaphanous. For instance, Cohen maintains that “it is essential that we limit the scope of relationalism to those theories that construe colors in terms of relations to subjects” (Cohen 2009, 28). In the scope of the present book, this is exactly what we should not limit ourselves to. In fact, being in relation to a subject does not help to flesh out a theory of experience. It’s a recipe for circularity.

In contrast with traditional relationalism, the actual object is not constituted by a relation, let alone a relation with a subject. An actual object is neither subjective nor objective; it is both relative and actual. For lack of a better term, I can’t resist coining a new word. The actual object is *realtive* – i.e., relative and active.

The object is neither subjective – because it does not depend on any subject but on other objects – nor objective – because it is not absolute and its existence is relative to some further event. Moreover, the object requires a contingent occurrence. The actual object is contingent, active and actual. In short, it is *realtive*.

The very notion of relation is no longer needed once identity can provide for everything we need. In fact, relations in general have been introduced to *relate* separate entities. Thus, once it was assumed that brain and world were separate, relations were called to the rescue. The problem is that, in the physical world, we never observe relations. We postulate relations or we use relations to speak of otherwise separate entities. I can speak of all kinds of relations and they are, from an epistemic perspective, extremely useful. We never experience them. We’ve seen particles, waves, and objects. But have we ever taken a picture of a relation? Of course not. There are only actual objects.

## 5.5 Bodies are object-makers

Every time an object offers the possibility for another object to exist as its cause, the latter is brought into existence where and at the time its parts were. The notion of relative existence is then a jack of all trades that promises to solve all cases of alleged separation between appearance and reality. It allows us to explain a change in appearance by means of a change in the reality that is causing effects in one’s body. An actual object does not have an absolute size, color, or shape, and so forth. All its properties are relative to the causal circumstances that another object offers.

Consider a few cases: a constellation, the color magenta, a forest, a faraway object, and a synchronized pattern.

The constellation is a case so familiar that there is no need to spend too much time on. A group of stars in different places and times emits light rays in all directions. In another place, at a different time, a planet hurtles through the void and crosses the path of a light ray from each of the stars. At that very point, a human body with the right kind of causal structure allows those causal processes to reach a common end and produce a joint effect. At that very time, the ontology of the constellation is set *relatively to* the effect and the constellation is brought into existence at the time and place where its parts were.

Consider now a composite color like magenta. Suppose you have a 1-foot-large red and blue 100 x 100 checkerboard – each cell is a hundredth of a foot. When you look at the red/blue board from a distance of 10 meters, the board looks magenta and no trace of the original red and blue cells is discernible. The board has a property, being magenta, which was not visible when you were at closer quarters. Yet, at 10 meters the property is unmistakable. What does this mean? Is it possible that the checkerboard is both magenta and red/blue? Yes. It is red and blue relative to your body structure at a distance less than, say, 8 meters. It is magenta relative to your body structure at a distance greater than 8 meters. Thus, by moving back and forth you change the property that that board instantiates relative to your body.

The nature of the board is not absolute. It depends on which physical system the board interacts with, and the distance of the physical system is surely a factor that influences the ensuing causal process. Thus, if there is no physical system, or there is no light, the board will be neither magenta nor red/blue. If there is light (among other necessary conditions) but no other physical system is around, no color will obtain. If there is light and the physical system is like that of a standard human trichromat, it will depend on the distance. If the human being is at a distance of, say, less than 8 meters, the red and blue grid will take place on the board. If the human being is farther away than 8 meters, the magenta will take place on the board. For intermediate distances, finer considerations must apply.

If there are two standard trichromats, say, one at 7 meters and the other at 13 meters, the board is both red and blue, relative to the closer observer, and magenta, relative to the farther one. Or suppose that Emily is very shortsighted. With her glasses on, she sees the grid; without them on, she sees a magenta board. Does she see something that does not exist in the latter case? Not at all. The fact is that if the causal properties of her body change, a different external object will be brought into existence. What exists on the board is relative to the position of the observer and, by and large, to their physical features.

Consider now one final case – leaves, trees, and forests. It is a hot summer and you are in the Italian Apennines – a long chain of hills running from the south to

the north of the Italian peninsula. You walk in the woods. After some time, you see a nice spot to rest in the shade of an impressive beech. You stop to enjoy the shade. At such a short distance, you may clearly distinguish the sparsely toothed shape of its leaves. You can count each of the leaves. Then you keep walking until you reach an open area and eventually turn around. You are now 100 feet from the oak. The oak is impressive and your sight of it is perfect. Yet, at such a distance, the leaves are no longer distinguishable. You may clearly see the branches and the foliage, but the individual leaves are lost. The heat is increasing and you want to reach a nearby hill. You speed up. After half an hour, you reach the top of a nearby peak, called Mount Gottero. From there you look down at the clearing where you rested. You can see the beginning of the forest and you have a rather good idea of the exact spot where you have been. But the individual trees are now lost in the greater shape of the beech forest. There are neither leaves nor branches from here. The forest is a huge and largely undifferentiated green moss covering parts of Mount Gottero's lower slopes and little valleys. It looks like a brownish dark-green blanket leaning over the rocks. This is an everyday case painters are rather familiar with. When you have to draw a tree, don't try to draw the leaves; when you have to draw a forest, forget the trees. *The distance changes the object you have in front of you.*

Everything is relative but also real. All changes in what one sees are explained as actual differences in the actual object that is one's experience. Another extreme case is offered by perspective. It is well known that faraway objects look smaller. The usual explanation is that they project a smaller image onto the retina. Let's consider an alternative possibility: *faraway objects are actually smaller*. Is it possible? They are smaller relative to the object they are causally in relation with. In this case, the object is one's body. If the body is closer, the causal power is greater. If they are farther away, their causal power is diminished and, relative to it, they are smaller. Before taking the argument to be crazy, consider for a moment that the size of an object is not judged on the basis of absolute space (which does not exist) but on the basis of relations with other objects. If an object is located at different distances, every relative measurement will change proportionate to the square of the distance.

Consider this case. You use a square panel emitting ultraviolet light to get a sun tan. The side of the panel is 2 meters long. If you keep the panel at 1 centimeter from your body, it completely covers your body's surface. Suppose that, in such a condition and with your complexion, you are going to reach the desired level of tan in 1 hour. If you keep the panel at a distance of 1 meter, its causal power will be diminished as though the object were smaller. It will tan your skin as though it were a much smaller panel at a closer distance. Causally, a smaller panel at a shorter distance and a larger panel at a greater distance are equivalent. Of course, there are all kinds of different causal properties and not all are going to diminish according to the same proportion.

Or consider a faraway star. From such a distance it acts as though it were a very dim, twinkly source of photons. From such a distance and relative to our body, the powerful and mighty Sirius is only a small light source capable of stimulating a few rods in one's retina at a time. The Sirius I see from Earth is only a very small subset of the wondrous sphere of plasma that burns in the sky.

Or consider the building I see at the other side of the road. It looks quite small from here, although I know it is much bigger. The big portal on the building is much larger than my body, but from my vantage point it looks smaller. Can it actually be smaller? I know that it cannot be smaller because I know that if I moved closer, it would be much bigger than it looks. Yet ... If I move my body, the actual object that is the building will exist relative to my body in the new – and closer – position. It will then be a different actual object. Thus, the size of the building relative to each object depends on the distance of the building from the object. Thus, I cannot draw any conclusion that, from the fact the building is larger when I get closer. When the position of my body changes, the causal circumstances by which the object can be what it is change too. The actual object does not have absolute properties. Its properties change according to the causal circumstances. Size is among those properties. Surprisingly, then, faraway objects look smaller because they are smaller. Of course, human beings are often interested in the size of an object of the time when they touch it. Skin contact is a useful reference condition and it makes sense to choose, as the standard size of an object, the size that the actual object would have if relatively to a human body at a touch distance.

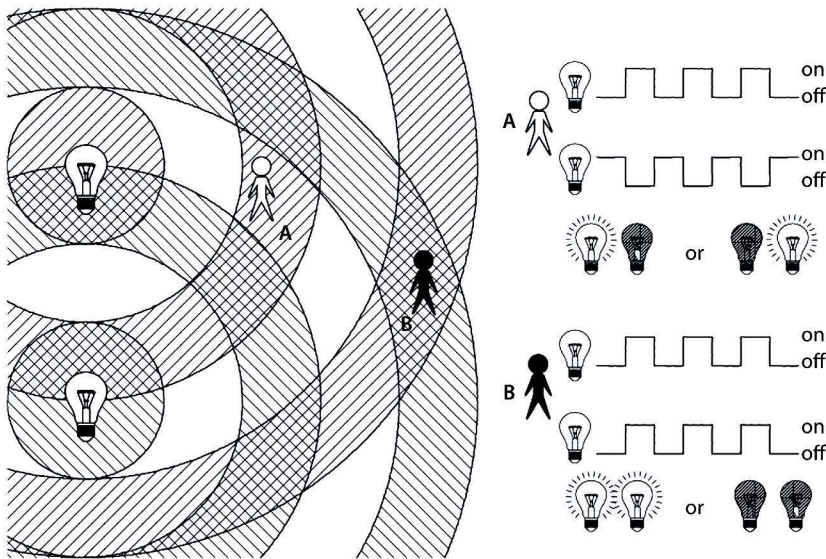


Figure 4. The existence of a temporal pattern depends on the distance

A final example is given by temporal patterns (Figure 4). For the sake of simplicity, suppose that there are two flashing lights. They switch on and off at 1-second intervals. They are placed at a distance of 3 light-seconds (roughly half million miles). They have been synchronized so that if one were in the middle point, they will be seen firing together. Let's accept such a toy setup it for the sake of the example. The flashing of the lights partitions the space into regions. Depending on the distance, in some regions of space they are seen as two lights flashing together and in other regions they are seen as two lights flashing intermittently. Such a difference does not depend on them but on the distance of the physical system that measures them. Thus, they can be completely different patterns: one is made of two lights flashing together; the other is made of two lights flashing intermittently. Clearly they are different objects. Yet, they originate in the same location in space. What changes and makes it possible to have different objects is the fact that observers at different distances offer different causal circumstances. Thus the temporal pattern is relative but real. Once again, it is *relative*.

Thus, the ontology of the world is not fixed *a priori*. It depends on the causal circumstances that at other subsequent times other objects offer. Our bodies, like all other objects, play a causal role, bringing other objects into existence. Such objects are our experience. Changing the properties of our bodies – their position and structure – changes the objects that one brought into existence. Our bodies are causal gates that either allow or prevent the existence of objects. Bodies are objects maker or, if you prefer, world makers.

## 5.6 Actual objects and time

Actual objects depend on the occurrence of a causal process. The actual objects are brought into existence by a causal process and not by an abstract constitutive relation. For nomological reasons, every causal process requires time to complete. As a result, every object has a temporal character depending on a causal process physically embedded in space-time.

The object is brought into existence by an effect that is, at the very least, a bit later than its cause (the object). Thus, the problem of wholes shifts from a time-less analytical perspective to a temporal and causal view. A whole corresponds to a causal process in time and space. An interesting consequence is the fact that if there were no time, there would be no wholes – no time, no wholes.

The intrinsic temporal character of objects might seem bizarre, but it is not. In our everyday life, everything is in temporal flux. Change is of essence and change cannot take place without time. If there were no time, there would be no change (*vice versa* is tempting too). In brief:

Objects depend on effects; effects depend on change; change depends on time.

Here, I leave untouched the question of whether time depends on change or *vice versa* (Smolin 2013). In general, such a dependence on time has a series of interesting consequences that help to substantiate the notion of actual object.

A first issue is the apparent backward temporal nature of objects and wholes. Whenever the parts an object is made of takes place, the joint effect that brings the object as a whole into existence will take place later. For the sake of the discussion, assume that the parts take place simultaneously at time  $t$ . Clearly, at time  $t$ , those parts have not yet produced any effect. There's no object. Neither are they the parts of an object since the object does not yet exist. If they occupy different positions, any physical influence cannot travel at a speed faster than light, which is not infinite. Thus, given any collection of events, their effects will take place after a discrete time  $\Delta t$ . Thus, given a time interval  $\Delta t = 0$ , no object exists at anytime  $t^* < t + \Delta t$ . The object will come into existence only after an effect has occurred at a time:  $t + \Delta t > t$

The object cannot exist before the effect occurs. In fact, the occurrence of the effect, as has been stressed many times, is contingent. In other words, the effect may or may not happen. Thus, the object cannot exist on the basis of trust about whether the effect is bound to happen. And yet, crucially, once the effect has occurred, at  $t + \Delta t > t$ , the object is brought into existence because there could not be any other cause. Thus the object is not overdetermined. By the same token, the object must have been there from the start, yet only after the effect took place.

A way to visualize what happens is to assume that the existence of the actual object remains uncertain until the effect occurs. When the effect occurs, the existence of the whole is finalized. The actual object is brought into existence only when the effect occurs at  $t + \Delta t$ , yet, crucially, when the effect occurs, the actual object had always occurred at time  $t$ .

While the above temporal sequence may appear rather garbled at first sight, it does not contradict anything. On the one hand, it does not contradict our everyday life since we have no commerce with anything that is not the cause of an effect and thus *we do not need to postulate the existence of causes until they have fathered their effects*. On the other hand, it does not contradict the scientific empirical description of reality because sterile causes (as I call an alleged cause without any effects) are completely useless in the functional/causal description of reality.

A second critical issue is the relation between time and objects. If it were possible to freeze time, objects would disappear. As a matter of fact, everything would disappear. In fact, without time, change would not be possible, hence effects could not take place and, crucially, without effects nothing could exist relative to anything.



Thus, everything we are familiar with would disappear. The commonsensical opinion is that existence and time are separate aspects of nature and that, if time were halted, everything would remain frozen, snapshot-like. Raindrops, snowflakes, cars, and bystanders would remain motionless. Patterns and shapes would be untouched. Naïve objects would continue to exist. Actual objects would disappear. Naïve objects, though, are not real! In such a timeless instant, there would be no sounds since sounds require time in the sense outlined here. There would be no words, since words are composed by sound waves. There would be no neural activity, since neural activity is implemented by means of chemical sequences spanning time. There would be no light, since light rays travel in space-time. Further, there would be no faces, patterns, shapes, or wholes. There would be no causal processes. Finally, there would be no objects since objects require time to take place.

Time and objects cannot be split because objects are constituted by causal processes and, in turn, causal processes require time. The confidence with which we imagine a frozen, timeless reality is likely to be the historical offshoot of scientific, logical, and linguistic descriptions of reality that have done their best to sweep time under the rug of a transcendental ontological layer. Ideas do not change. Nor do mathematical laws. Science and culture have tried to get rid of time and change (Smolin 2013).

Third, it is worth stressing that different objects may require different time spans to be brought into existence. For instance, the occurrence of a face needs the time required for light to go from one person to another, plus the time required by the neural machinery of the beholder to allow the face to eventually produce a joint effect. On the other hand, the two events at the inputs of an electronic AND gate produce an effect in a much shorter span of time. A constellation may have to wait hundreds of years to be borne by a distant and very unlikely effect on a far-off planet. The time of uncertainty for each object is different and corresponds to the time required for the corresponding joint causal process to occur.

Fourth and finally, since wholes do not exist but rather take place, wholes are temporally located. A persisting whole needs to be continuously rehearsed. For instance, a red apple is not an everlasting object; it does not take place once. It needs to take place again and again until we perceive it. The causal process has to occur again and again between the stuff on the table and one's body. Indeed, this is what happens – every time we look at the apple, a new train of light rays travels from the table to our bodies. Every time, a new causal process is fired and consumed. Every time, a new actual object takes place and is brought into existence.

A convincing analogy is offered by a traditional film of a static object. Consider watching a movie of a red apple – a very boring movie of a motionless red apple on a table. Any time you look at the silver screen, you see the projection resulting from a different film frame dropping exactly in front of the light

beam because of the wonderful precision of the intermittent sprocket. Therefore, any time you cast a glance, you see a different film frame, or a different physical object. Yet your visual experience is indistinguishable from that of a juicy, red apple. For the sake of the example, I omit here any difference due to stereopsis, disparity, accommodation, and so forth. Alternatively, you may contrast a movie of a still apple and a still slide of a single frame of an apple. When you look at the juicy, red apple, a recurring physical process from the apple to your eyes takes place. Many times per second, a different train of light rays travels from the apple to your retina. Thus, what your experience is made of – the red apple you perceive – is a series of identical red apples taking place. The very red apple you experience is taking place right now.

The case of the film is an intuitive demonstration that we do not perceive a static reality, but a *temporally recurring* world – albeit one that is very coherent and thus provides a substantial feeling of *stillness*. When we watch the movie of a still object, we perceive a still object that does not change. Yet, we know that, at any given moment, we perceive a distinct film frame. Normal perception is akin to watching a movie, only we do not perceive a mental movie, but a sequence of identical apples – which we conveniently lump together.

### 5.7 A hoard of actual objects

Each causal process singles out a different causal process. A visual apple is, of course, a different object from a tactile apple or a gustatory apple. Such objects, though, are not different subjective objects – they are different causal objects that single out different causes from the physical continuum. Molecules that are key causes for the somatosensory cortex are completely immaterial for the visual cortex. The neutrinos inside the apple are utterly immaterial for any human bodily structure, and so forth. We lump together the visual apple, the tactile apple, and the gustatory apple for economical but parochial reasons – i.e., the apple can only be eaten once.

Basically, the notion of actual object suggests that any time we perceive an object in a different way, we perceive a different actual object. The allegedly persistent object is the Galilean object – a useful but immaterial abstraction. The momentary object we perceive at any time is the actual object – a concrete, contingent causal entity.

Such a proliferation of objects should not worry. First, as mentioned earlier, the proliferation of relative velocities is not an issue. Relative velocities are much more numerous than absolute velocities as each object has umpteenth relative velocities. Second, although actual objects are much more numerous than traditional



Galilean objects, they are causally fixed and thus perfectly definite. Their number will surely be rather large, but it will be a finite number.

Having a multiplicity of objects allows us to cope with a traditional arguments for separating experience and reality: appearance is inconstant while the world is assumed to be stable. Yet, such a separation is only the offshoot of the platonic heritage surviving in Galileo's scientific method. In fact, modern science has postulated the existence of a transcendental domain of immutable physical quantities, and given the burden of coping with the ever-shifting nature of reality to subjective appearance.

In the mind-object identity account, there is no need to contrast objects and changing appearances. Every time one experiences something different, something numerically different comes into existence. Thus, reality is a series of tokens – each one is a new actual object, like a new frame. Each one is a new actual object and, because of altered causal circumstances, might be a different one. Thus, it should not come as a surprise that reality keeps changing, it really does. It is not experience or appearance that changes. It is the external object that changes. Subjective experience is fleeting because the world is made of fleeting relative objects. They are fleeting both because the world changes but, crucially, also because our bodies change and thus bring into existence different relative objects.

Likewise, different sensor modalities pick up different actual objects from the same physical continuum. If I experience the visual apple, the set of physical events that partakes my experience is of optical nature. If I experience the tactile apple, the set of events is of mechanical nature. And so forth.

Sensor modalities are not different ways of seeing the same object. Rather, they are different causal circumstances that bring different objects into existence. Among such different objects (the tactile apple, the visual apple, the aromatic apple), various relations hold and, as abovementioned, because of their practical importance they conjure up beliefs in the existence of the ideal apple. Different sensor modalities are convenient – albeit a bit parochial and selfish – lumps of actual objects that fit together.

If every object is relative to other objects, in practice, we can surmise the existence of a hierarchy or a ladder of objects. A practical way might be as follows – given a certain possible object, how probable is its existence given the existence of its parts?

For instance, take a pebble – how likely is it that it will interact gravitationally with another object? In practice, 100 percent. Given the structure of our universe, the allegedly infinite radius of gravity, and the impossibility of gravitational shielding, it is impossible for any mass not to take place as a mass. The same considerations apply to many basic properties of the physical world – electric charge, magnetic fields, and nuclear properties.

Consider, now, at the other end of the spectrum, the relation between, say, the different sounds produced by the instruments of a huge orchestra playing Schönberg's *Suite for Septet Op. 29*. What are the chances of such a supremely complex pattern of sounds producing a joint effect and thus taking place? I would say rather scanty. To my chagrin, I confess that my own brain and ear would not be up to the task! Dodecaphony is completely wasted on my ears! But a very selected number of listeners would surely allow such tunes to exist as a unified composition.

There is no ontological difference between a pebble and Schönberg's *Suite for Septet Op. 29*. Both are objects made of physical parts. Both take place and have an active causal role. The difference is practical. The pebble has an almost complete certainty of happening, while Schönberg's *Suite for Septet Op. 29* is extremely unlikely and, in practice, very much dependent on human beings.

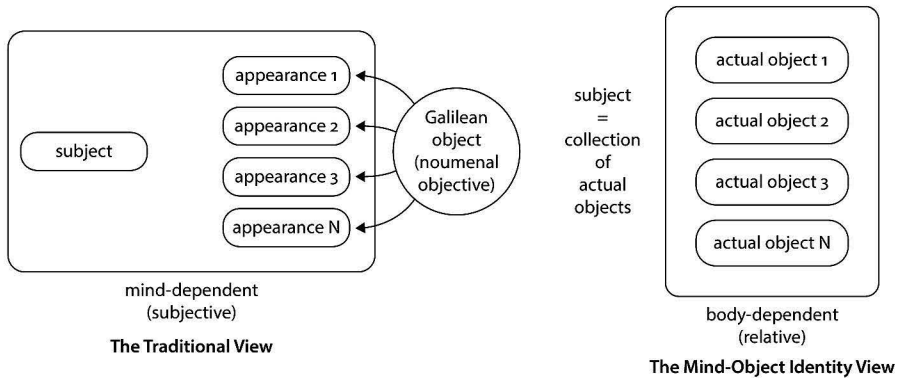


Figure 5. Appearances and actual objects

Entropy offers a tempting analogy. What is the difference between a highly-organized state of matter and a disorganized one? Between a state with low entropy and a state with high entropy? It is not a difference in the state itself, which is just one among the many possible ones, but in the number of states indistinguishable from the one under scrutiny. By the same token, the objects that appear the most real are the ones that are a cluster of indistinguishable objects. Since they are indistinguishable, they appear to be the same, while they are a collection of numerically distinct objects. In contrast, objects that are more easily distinguishable are also less likely. Thus, objects too are related to their relative entropy like states of matters.

We can conceive a continuous hierarchy of objects ranging from almost absolute certainty up to greater unlikelyhood. Such a series allows us to distinguish between things that are always there and things that require unlikely (yet possible)

causal circumstances. The former group corresponds to objects that we usually deem very real; the latter group is made of objects we deem to be unreal or human-dependent. The difference is only a matter of degrees.

## 5.8 Spatiotemporal objects

Actual objects are carved out by causal processes. Causal processes take place in time and, crucially, are triggered by causes that are possibly spread over time. This is not an esoteric claim, but something we are all familiar with. Consider listening to a piece of music, say Bach's canon in D, BWV 1072. The composition extends for several minutes and experiencing it requires, on the side of the listener, the capability to perceive a musical object that is spread over a relatively long time span. When we listen to a piece of music, we don't hear only the notes that are played at a given punctual instant – we hear something that is spread over a rather long time span. Actually, one of the main differences between musical genres is the expected length of such musical sentences – the longer they are, the more difficult the listening experience. For instance, the basic musical components of many of The Beatles' times are rather short – a few notes and then a new musical unit is thrown in the track. The listener can almost immediately grasp the whole musical sentence that underpins "all you need is love" – each line is a complete musical object. On the other hand, Richard Strauss's *Tod und Verklärung* requires a learned listener capable of grasping long musical units extending for several measures.

As a matter of fact, the common time, the 4/4 measure, is also a rather easy and natural temporal size for easy listening. Its popularity is likely due to its tempo that is a good trade-off between a interval long enough to contain interesting musical patterns and an interval short enough for most listeners to grasp. Easy-listening themes have musical sentences that fit into one measure or little more. This is not to say that longer musical listening units are aesthetically more valuable. However, it is a fact that longer musical sentences, as in Strauss's work, require a more learned ear. In other words, certain musical scores require a more sophisticated physical system to take place as a whole. Most human beings are able to allow a measure-long series of notes to take place as a whole, but only a few have developed their musical skills to the level required to pull into existence complex Strauss's musical scores by giving them causal dignity.

The topic has been raised in Father Burdin's objection to Descartes (*Seventh Objection to Descartes' Meditations on First Philosophy*, 1685):

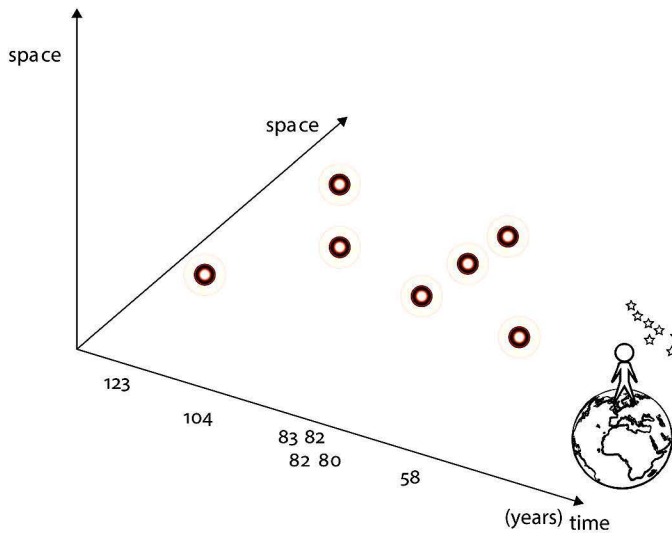
I know a man who once, when falling asleep, heard the clock strike four, and counted the strokes as “one, one, one, one”. It then seemed to him that there was something absurd about this, and he shouted out: “That clock must be going mad; it has struck one o’clock four times!”

Is an object composed of four strokes a whole? Yes and no. It is a whole relative to a physical system that, like a human being, is able to allow the four strokes to produce a joint effect. In a world of, say, simpler organisms, the bell would strike ‘one’ four times.

Uttered speech is another familiar example of objects spread in time. It’s not only sentences that require time to complete, since single words are spread for a substantial fraction of a second or more. Our experience of spoken language is made of words and sentences – spoken language is made of words and sentences. Gestures, visual expressions, actions, and flashing lights are all familiar examples of objects spread in time (and not only in space). The list is infinite, and by no means unusual.

To recap: an actual object is made of parts that, thanks to another physical system, take place as a whole. Such parts have their own spatiotemporal location. The only constrain is that the parts must have taken place before the joint effect. Such parts can be distributed in space (like the visual features on a face) or distributed in time (like a series of notes or a series of uttered syllables) or both.

As a matter of fact, objects apparently spread in space are usually also spread in time, as neuroscience has shown abundantly – different visual features require neural processes of different complexities and thus different times. Color is faster than movement; visual facial features can be both very fast and rather slow to grasp (Bartels and Zeki 2004; Holcombe 2009). In fact, the human visual system has multiple temporal durations fixed in its various constituent mechanisms. Motion direction, depth, and edges are usually relatively fast. Color pairing and motion, the joint identification of arbitrary spatially separated features, the recognition of words, and high-level motion take more time. Moreover, the neural machinery confines our processing of time – “Events confined to thousandths of a second, and sometimes even hundredths of a second or longer, are not perceived” (Holcombe 2009, 216). In this regard, it is both remarkable and instructive that, until the second half of the 19th century, it was not known whether a galloping horse lifted all four hooves off the ground at any one time – only brief-exposure photography provided an answer (Crary 1988; Carroll 2008).



**Figure 6.** An actual object extended both in space and in time (Ursa Major)

Sometimes, the spatiotemporal nature of objects is even more dramatic. Consider again the Ursa Major constellation (Figure 6). Its stars are located at different locations and different times. When we look at it, we see an object whose parts are temporally distant up to 67 years. In fact, the closest star, Megrez, is 58 lightyears from the Earth, while the farthest, Dubhe, is 123 lightyears from here. Thus, what we see is a spatiotemporally spread object that spans 67 years. Yet, it is not different from, say, a face that is made of parts spread over a few hundred milliseconds (Holcombe 2009). Everything is spread both in time and in space.

The unity of the present that we experience is not the result of the flattening of nature on some internal representation. There is no need for an instantaneous mental dashboard over which the temporal complexity of reality gets portrayed on a static polaroid. Reality is temporally thick because it is made of wholes that are naturally scattered in time and made of parts that are distributed over time. As in visual perception, there is no need for an internal unified visual representation. The unified space of visual perception is not an internal projection, and neither is the unified time of experience. They are both actual objects unified by the possibility of producing an effect via our bodies. The spatiotemporal unity of the object depends on the occurrence of a joint effect; the object, though, can be scattered both in time and in space.

## CHAPTER 6

# Consciousness, body, and world

*Man is the measure of all things.*  
(Protagoras)

Three traditional notions – ‘mind’ (aka experience), ‘body,’ and ‘object’ – can thus be revisited from a purely materialistic perspective. The goal is to reduce the mind to the object, rather than to the body.

The body is an observable part of the physical world. It has causal properties. It is spatiotemporally located. It is a physical entity. Its properties are quantifiable and measurable.

The external object is amenable to observation and measurement. It is physical. It has causal properties. Its properties are quantifiable and measurable. Up to here, neither the body nor the object is ontologically problematic. Everything is physical.

Then consciousness (aka experience) steps ahead. As argued above, consciousness is problematic only if one assumes that it is either not physical or it has properties – such as intentionality – that no physical entities can muster. Where and what is consciousness, then? The proposal is that consciousness is physical but it is not inside the body. The conscious mind is the object, or rather a collection of objects. At any given time, the conscious mind is the object, or the collection of objects that one experiences.

What is the role of the body? The body allows the external object to exist and to interact with other objects – as in the fridge light example. The body is a sort of causal enabler. It enables the world we experience to have the very causal properties we experience, and thus to be the very object we perceive and are. The body brings into existence the objects our world is made of – the objects our experience is made of. Francis Bacon wrote that “Opportunity makes a thief”. Likewise, the body offers the opportunity to the world to take place as the object we experience: “Opportunity makes an object”. The body is such an opportunity. The world we live in and our experience of the world are, in such a model, one and the same.

A good metaphor is offered by a dam and its lake. A dam is among the necessary conditions for formation of a lake. However, the lake is not the dam. The lake is made of water while the dam is made of concrete, brick, and steel girders. Furthermore, if there were a drought, the dam would not be able to create a lake. The

lake takes place – and thus exists – thanks to many conditions (a suitable terrain, a certain amount of rain, the dam). From a builder's perspective, the dam is crucial for the existence of the lake. Yet, the lake is neither identical with nor constituted by the dam. The dam plays a contingent causal role. A dam-lake identity theory would fail. Likewise, the body plays a contingent causal role insofar as the object one experiences takes place. The body causally singles out a certain object among the many possible ones.

Is the dam somewhat special as regards other causal circumstances in bringing the lake to existence? Not ontologically. The dam plays the same role as, say, the terrain or the rain. They are all among the opportunities that bring the lake into existence. However, in practice, the dam is key since it is the causal factor that can be controlled. Rain and terrains are beyond control. By the same token, the body is not any more special than the rest of the external world. Yet, the body is key because it is the causal factor under direct control.

Back to the object, you see an apple from a certain angle and with certain properties – color, smell, texture – among the umpteenth possibilities. The apple your experience is identical with, which is outside your body, is only a subset of what that portion of the physical world might be. It acquires causal relevance – i.e., comes into existence – thanks to the interaction with your body, which has certain sensorimotor and cognitive skills. The body allows such an apple to exist. The apple you perceive, though, is not God's apple. It is not the ideal Galilean apple; it lacks many physical features an ideal object would have. Nor is it the ontologically aloof naïve apple. For instance, you do not perceive the inside of the object, nor the hidden side, nor many chemicals, nor infrareds. And so forth.

What you call the apple is a subset of the physical continuum in front of your body. The object you perceive is the one your body selected among many available ones. Yet, such a subset singles out exactly the object you perceive and your experience of it – the two being the same. The apple remains outside the body and it is not a property of the body, as the lake is not a property of the dam. Experiences are not inside bodies, but bodies are necessary for the physical things one's experience is made of to exist. We are such things.

In this case, language is misleading. The traditional sentence 'we see an object' is confusing, since it suggests that there is a multitude of entities – i.e., 'we,' the experiencing of something and the external object. The hypothesis I put forward is simpler. There is only one thing – i.e., the object – which is our own experience. We are our experiences. The body brings the object into existence. We are the object rather than the body.

Not only does the external object have the same properties that experience has, but it is also there when we experience something. Thus – momentarily

leaving aside memories, dreams, misperceptions, illusions, and hallucinations – the external object is an obvious physical candidate for consciousness.

It is perhaps ironic that this account, to some extent, is a vindication of Descartes insofar it shares the insight that we are not identical with our own bodies. We are utterly material though. And yet, in a perfect causal sense, we – i.e., the world our experience is identical with – act through our bodies. We are not them.

The body, or some part of it, is contingently necessary, but it is neither *sufficient* to nor *identical with* conscious experience. The object has a contingent necessary dependence on the body that is coherent with the wealth of data from neuroscience. In fact, all the evidence gathered by neuroscientists has never provided a single case in which neural experience is *absolutely sufficient* for consciousness. They have proved only that neural activity is *contingently necessary* for consciousness. Here, the notion of absolute sufficiency is cognate to that of local supervenience. For instance, being materially identical with a certain painting at the Louvre is not enough for that painting to be the *Mona Lisa*. Material identity is not sufficient to be an original artwork. Historical whereabouts matter too.

To recap, without the body, conscious experience cannot occur because the physical object consciousness is supposed to be identical with would not take place. Yet, consciousness is not a property of the body. Nor is it something additional to the object. Period. One's experience is the object and the object is one's experience. The body allows a collection of objects to cause a joint effect – to act together. Such a collection of objects is a sort of giant object that, for a moment, exists by means of the causal bottleneck that is one's body. In other words, the body allows a subset of the world – i.e., a collection of objects – to take place as a spatiotemporally composite super-object, which is an object nonetheless. At any given time, such a super-object is what we call one's mind (or one's consciousness) – which is nothing but a collection of objects. It is one's world.

## 6.1 The actual world

Each body has a different causal structures. Bodies offer different causal opportunities to external causes. My body and an ant's body have completely different causal properties. In general, even if I am roughly in the same place as the ant, say a meadow in Massachusetts, the causal processes that take place because of my body are different from the causal processes that take place because of the ant's body. Molecules that would be causally inert because of my body spring into action and produce effects through the tiny ant receptors. Conversely, the shape of the cloud, the noise of the wind through the tree branches, and the golden hue of the sunset produce effects only because of my body. Each body



thus carves out a subset of nature – i.e., the subset that is causally active because of that particular body.

Such a subset is not that different from an actual object – it is an actual object. It is only more scattered and, by and large, less likely to be repeated. The world I perceive at any given moment is an ever-changing combination of multiple events and objects that will never repeat. Yet, from a physical perspective, the momentary world I perceive and the red apple are just collections of causes.

At this very time, the world my experience is identical with is made of clouds, trees, leaves, branches, mountains in the distance, grass, and an ant. The red apple that was my experience yesterday is made of a surface of cells, reflected light, and molecules. Both things – the world I perceive now and the red apple – are collections of physical causes that, on one occasion, produce a joint effect through my body. Of course, the objects depends as much from the external world as from the properties of the bodies that varies from moment to moment. My body and my son's body too are very different. My body at noon is slightly different from my body at night. My body when I wear glasses is different too.

There is no ontological difference between worlds and objects. Worlds are giant fleeting actual objects, and everyday objects are repeatable and relatively stable small worlds. Taking advantage once more of the metaphor of the film frame, an everyday traditional object – an apple, a car, a box – is like a film where all the frames are very similar. The world we live in is like a film where all frames are different. Yet, both are films and both are made of frames. Each frame is an actual object. The film is the traditional object. The world is an object. My mind is an object.

Everyday objects are tiny worlds. They are highly circumscribed and sharply carved out actual objects. Everyday objects acquire a stronger ontological status in our discourses about the world because they get names. Christening an object with a name is an act that awards that object a more stable ontological status. Such an act, is only an honorary title. It is a widespread practice for farmers to not give names to their livestock. They give names only to those animals that are not going to be eaten. Yet, the lamb that will be stewed is no different from the cat sitting on granny's lap. Of course, the difference is of practical importance for the animals and only of emotional value for the farmers. Yet, it is not an ontological difference. The animal is and remains an organism, with or without a name.

Thus, we give names to series of actual objects whose elements resemble each other – the red apple, the Taj Mahal, the Pink Panther, the Prudential Tower, my new car. We do not give names to objects that keep changing and that only last for a moment. We do not give names to waves, clouds, scattered and temporary collection of objects, whirlwinds, rainbows, reflections, and flames. Yet, there is

continuity between such objects and one's familiar everyday objects, which remain stable for relatively long periods of time.

The notion of the actual world, a subset of nature carved out because of its causal relation with a particular body, is germane of Jakob von Uexküll's notion of *umwelt* (von Uexküll 1909; von Uexküll 1957) – each animal lives in a subset of nature that is defined by the causal properties of its body (von Uexküll 1957):

We must first blow, in fancy, a soap bubble around each creature to represent its own world, filled with the perceptions which it alone knows. [...] A new world comes into being. (5) As the number of an animal's performances grows, the number of objects that populate its Umwelt increases. (49)

Similarly, I suggest that one's experience is identical with the particular subset of the physical world that takes place because of the causal intercourse with the body. Although there are many analogies, the similarity does not need to stretch too much. There are at least three main differences. First, the notion of *umwelt* is parasitical on that of action. Second, it is unclear whether von Uexküll is a phenomenalist. Third, the *umwelt* is more dispositional than token-based. Finally, the actual object does not need a living organism.

Another cue that backs up the identity between experience and world is that the properties of the world we experience match perfectly with those aspects of the environment that have causal intercourse with our bodies. The list of the physical properties we experience and the list of the properties that take place thanks to the causal structure of our bodies are a perfect match. We live in the subset of the world that exists because it is causally connected with our bodies.

As the actual object is relative to some contingent effect, so an actual world is contingent on some ensuing contingent effect. Such an effect, as regards our experience, is hosted by our body. The body is thus the causal cradle of the world we live in. Such a world is not created inside the body; neither is it of a mental nature. Our body is the dam that keeps the world – which our experience is identical with and we live in – together. Such a world is outside, yet the necessary (and not sufficient) conditions for its existence are set inside our body.

Our bodies are world-makers. If we change our body, we change the world that our body brings into existence. If we become blind, the whole collection of visual objects ceases to exist. If we develop our skills, new objects, which were previously only a possibility, pop into existence. If we change the physical structure of the body, the part of the world our bodies scoop up from the physical continuum will change accordingly.

If we could change our retinas, we would pick up new properties from the environment and this, predictably, would change the basis of our visual experience. We can change our bodies in many different ways – development, prostheses,

devices, culture, education, training, drugs, impairments, diseases, traumas. All these interventions, in one way or another, change the causal structure of our body and, accordingly, change the part of the world that is our experience. Such changes either allow new actual objects to exist or compel old ones to continue to repeat. Concisely, we can state that

$$O = C(B, W)$$

where  $O$  is the object, which is also our experience,  $B$  is the body/brain, and  $W$  the world in which our body is located.  $C$  represents the causal connection. If  $B$  changes,  $O$  will change too. This dependence explains why if the body is different (a pair of glasses, a damage in the retina, a cognitive alteration), the external object will be different too. It is different but it is nonetheless external.

Yet, as I have mentioned again and again, a body is only a physical system, it is yet another physical object. It does not have any emergent properties. And the brain is only an object – there are no special powers here, either. The brain-body is an object that allows other objects to take place. Thus, *every object is an object-maker and a world-maker*. Every object produces changes in the environmental causal flow – such changes bring into existence new causes and thus new objects. In this regard, the brain is remarkable insofar that it has an unrivalled capacity to be causally coupled with an almost unlimited number of external causes.

## 6.2 Brains are never isolated

When are two physical systems isolated from each other? One may state that they are mutually isolated when no matter or energy can travel between them. Yet, such a definition does not consider the temporal factor. For instance, consider two systems,  $A$  and  $B$ , in the empty space. Leaving aside gravitational mechanisms, are they isolated? Suppose they are 100 lightyears apart. Suppose also that they are systems with very low energy emissions. For the sake of discussion, suppose that  $A$  emits only one photon every 100 years. Thus  $B$  will receive only one lonely photon once every 100 years. Are they isolated from each other? Are they isolated during the long 100 years that elapsed between the two photons?

Given the causal properties of neural structures, only causal connections mediated by physical processes transferring some physical quantity, akin to those suggested by Arthur Reichenbach, are considered here (Feyerabend 1958; Reichenbach 1958; Dowe 1992; Dowe 1995; Dowe 2000; Cameron 2006). This is appropriate because Reichenbach-like causal processes are a good model for information-carrying processes, since “the relation between a cause and an effect is a physical connection although it may not be the *necessary* connection Hume

referred on" (Salmon 1997, 16). Although it is extremely difficult to account for causation, according to Phil Dowe "it is not of crucial importance that the cause raises the probability of the effect, but rather that there is a set of continuous causal processes and interactions linking the two events" (Dowe 2000, 148). In short, there is a transmission of energy from the original cause to the final effect and this dictates that causation cannot go faster than light.

To grasp the importance of time in causal processes, consider one more example: a soccer ball kicked by a kid. Is the ball isolated between kicks? As in the above case with A and B, there is no direct causal influence between kicks. At every instant  $t$ , it is fair to maintain that the ball's trajectory is determined by the last kick it received, plus the gravitational field, the density of the air, the internal structure of the ball, and all the causal circumstances you like. But the last kick the ball received becomes a distal and remote cause of the trajectory. During the trajectory, at any instant, the proximal cause is the speed momentum of the ball at a previous instant. Between kicks, is the ball physically isolated from the kid? It does not seem right to maintain anything like that. Yet, between kicks the ball has no proximal interaction with the kid.

Now, consider two kids. They play with a ball kicking it back and forth. Apparently, the two kids interact together. However, at any time  $t$ , they never kick each other. They kick the ball. Yet, it would be absurd to maintain that, since they do not touch each other, they are not causally connected. They play together. Yet each kid's proximal stimulus is the ball and not the other kid.

A better definition of isolation is that a system is isolated relatively to another system if nothing in the former is the effect (or the cause) of something in the latter no matter how much time and intermediate causal hopes intercede in between. Note that such a definition does not require that the two systems are temporally coincident at the same time and not even that they overlap temporally. In fact, given the speed limit of causal processes, there are no simultaneous events in the commonsensical meaning of taking place at the same time. For instance, the Earth is not isolated from Ursa Major even though there is a distance of 5 lightyears between our planet and the stars of the Ursa Major. It is parochial to only consider time spans comparable to everyday human reflex times.

Since the brain receives causal processes from the environment and since the effect of such processes can last in time, brain and its environment are always causally connected. The brain is built in such a way that it allows remote actual objects to continue to produce effects. This is what happens when I meet a friend because we fixed a date weeks earlier, when I remember a deceased relative, or when I hallucinate a woman I met many years ago. In all such circumstances, an actual object – more remote than proximal ones – is still producing effects because of my brain. My experience is then identical with that remote actual object. This is

akin to everyday perception. The environment I live in is not restricted to the last 100 milliseconds or so – it is formed by all the past events that, here and now, still produce an effect. Such an environment is, there is no need to stress it again, yet another spatiotemporally scattered actual object.

More precisely, I argue that there is always a spatiotemporal portion of the environment that is causally connected with the brain, akin to the way in which two kids playing with a ball are causally connected. If this argument has any merit, it will mean that, in causal terms, there is no fundamental difference between cases of perception and alleged cases of isolated mental activity, such as dreaming. I challenge the idea that a living human brain – normally developed in a human body – can ever be disconnected from the environment because its sensorimotor connection has been severed at some time  $t$  during its life. On the contrary, I claim that at any time  $t$  a brain (or any physical system) is causally connected with events that took place at previous times  $t - \Delta t$ ,  $\Delta t$  arbitrary. Such external causes are the actual objects that are the experience of the brain owner.

In short (but still loosely), it can be maintained that physical systems akin to brains are not isolated from the environment as long as what happens inside them is the causal outcome of events that occurred earlier in the environment. When a system is declared to be isolated, *relative to what* should be specified. If I got locked-in syndrome right now, my brain would become isolated from everything happening to my body as of now, but nothing could sever the causal connection that links my past with my brain. Accepting only instantaneous causal influence is tantamount to claiming that two kids playing soccer do not interact.

### 6.3 Causal carvings

Here I would like to formalize the touches outlined in previous sections. Consider a toy world model based on Minkowski's spacetime (Figure 7). Consider a bi-dimensional manifold where each point  $(x, t)$  is an event (or a change in an object). As usual, assume that the maximum speed (corresponding to lightspeed) is equal to 1 ( $c = 1$ ).

Inside such a spatiotemporal manifold  $M$ , three separate regions can be singled out:  $B$ ,  $C$ , and  $W$ .  $B$  is the brain.  $W$  is all of nature minus the brain and  $C$ .  $C$  is the physical region connecting the brain with the world – i.e.,  $C$  approximates the sensory and motor apparatuses.  $C$  is the channel. Because of everyday physical conditions, any physical process affecting  $B$  has to pass through  $C$ .  $B \cup C \cup W$  is all there is. The intersection between  $B$ ,  $C$ , and  $W$  is empty.  $B \cap C = C \cap W = B \cap W = \emptyset$ .  $C$  filters all exchanges between the brain and the world. As a matter of fact, the brain is embedded inside several layers of tissue and the most efficient causal

pathway to the brain is through dedicated nerves. C modulates the causal interplay between B and W, possibly shutting it down entirely. For the sake of simplicity, C is taken to be infinitesimally thin.

T is the temporal interval considered. At time  $t_0$ , C becomes totally opaque to any causal influence, thereby dividing T into two temporal intervals:  $T_{\text{before}}$  (for any  $t < t_0$ ) and  $T_{\text{after}}$  (for any  $t \geq t_0$ ).  $T_{\text{after}}$  is the period of time during which the subject is allegedly isolated from the environment.

For instance, when the subject shuts her eyes, the effect of the environmental light on neural activity is considerably diminished. If more opaque and thick eyelids were placed over her eyes, total darkness would be achieved and the channel C would become totally opaque with respect to light. Identical conditions could be enforced for most, if not all, physical processes. Various cases of isolation can be taken into consideration. During  $T_{\text{after}}$ , she might be sleeping in a dark room. Or she could be under the effects of drug-induced sensory deprivation. Or she could be in a sensory deprivation chamber. Or the nerves reaching her brain may have been severed. In all these cases, many neuroscientists would maintain that her brain has been isolated from the surrounding world as of  $t_0$ . I will argue against this conclusion. After  $t_0$ , the brain is isolated from the world after  $t_0$  but it is not isolated from the world before  $t_0$ .

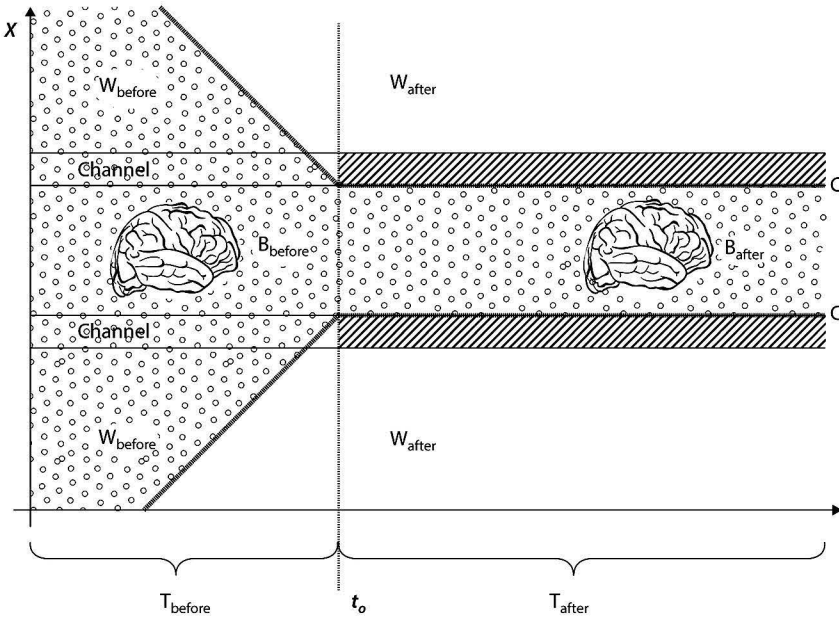
First of all, to check whether the brain is isolated, more precision is required as to the spatiotemporal boundaries of the environment. We must distinguish two spatiotemporal subsets of B:  $B_{\text{after}}$  and  $B_{\text{before}}$ .  $B_{\text{before}}$  is the brain before  $t_0$ .  $B_{\text{after}}$  is the brain after  $t_0$  ( $t \geq t_0$ ). We want to know whether  $B_{\text{after}}$  is isolated. Yet what is the environment of the allegedly isolated brain  $B_{\text{after}}$ ? Is it what is taking place at the same time or is it something else?

W too is partitioned into two parts by  $t_0$  and by the onset of  $B_{\text{after}}$ :  $W_{\text{before}}$  and  $W_{\text{after}}$ . Which of them is the environment of B?  $W_{\text{after}}$  is the spatiotemporal subset of W at any time  $t > t_0$  plus any event at any time  $t < t_0$  such that it was outside of the light cone defined by the onset of B. In brief,  $W_{\text{before}}$  contains events that are too far from B to be capable of having any causal influence on the onset of  $B_{\text{after}}$  at time  $t_0$  or events that occur after the channel shutdown. Finally,  $W_{\text{before}}$  is the spatiotemporal subset of W that contains those events that were close enough to B to be capable of affecting B at time  $t > t_0$ .

Consider now whether  $B_{\text{after}}$  ( $t > t_0$ ) is isolated from the environment. The answer depends on which spatiotemporal region singles out the environment of  $B_{\text{after}}$ . If the environment were singled out was  $W_{\text{after}}$ , which would be the layman's and many neuroscientists' choice,  $B_{\text{after}}$  would be isolated.

Since causal processes need time and the environment of  $B_{\text{after}}$  (whether defined by  $W_{\text{after}}$  or  $W_{\text{before}}$ ) does not coincide with the events inside  $B_{\text{after}}$ , the environment of any subset of  $B_{\text{after}}$  must be in the past of the onset of such a

subset. Thus, the environment must be a subset of the events inside the light cone defined by the region B at time  $t_0$ . Only events in the past can be the causes of events in the present of  $B_{\text{after}}$ . The farther the events, the earlier they must have happened.



**Figure 7.** A spatiotemporal set of regions: brain, channel, and environment. After  $t_0$ , the channel becomes causally opaque

I may now put forward a definition in causal terms of the environment of any temporal region  $X$ . Let  $X$  be a spatiotemporal region (or a system, or an object) – it will likely contain events  $x$ . I suggest that the environment of  $X$  is made by all those events  $y$  that are causes of any  $x$ . Formally, the environment  $Y$  of  $X$  is the collection of events  $y$  such that  $y$  is cause of  $x$ ,  $x \in X$ .

As to perception, it must be stressed that isolation entails solipsism. Therefore, isolation has its own reasons for concern. For one thing, the causal processes yielded by the environment to the cortex must have begun before their neural counterpart. Maybe the timespan  $\Delta t$  is usually not impressive, but  $\Delta t$  is always greater than zero. So if we stick, for any reason, to the notion that a region at time  $t$  is isolated only insofar as it is isolated by what happens *at the same time*  $t$ , we are compelled to accept that the brain is isolated during perception too – this would be a restatement of the time-lag argument (Myers 1957; Suchting 1969). The other option is more viable – namely the environment of the spatiotemporal region  $B$  at

a time  $t$  is defined by those events in the past of  $B$  that are causally responsible for what takes place in  $B$  at any given time  $t$ .

By and large, there are only two cases – either causation is only instantaneous and local or it is spatiotemporally extended. The first case is a non starter that leads to solipsism, since if causation were exclusively instantaneous and local, only synchronous events could be bound by a causal connection. Leaving aside cases of non-local quantum entanglement, instantaneous causation would entail point-like causation since any process is propagated at a finite speed. More generally, it would entail the spatial co-location of causes and their effects. The bottom line is that instantaneous causation entails solipsism.

The second case is more promising. If the environment of  $B_{\text{after}}$  is singled out by  $W_{\text{before}}$ , namely what happened before channel  $C$  shut down,  $B_{\text{after}}$  will not be disconnected. By adopting a causal perspective, it should be clear that the real environment of  $B_{\text{after}}$  is not defined by  $W_{\text{after}}$  but rather by  $W_{\text{before}}$  because it is the spatiotemporal region containing the events causally related with  $B$ . Temporal synchronicity is not a viable mean to define the environment of  $B_{\text{after}}$ ; causal connectedness is.

$B_{\text{after}}$  is not isolated. Its causal environment is  $W_{\text{before}}$ . Of course, after  $t_0$ , the causal opacity of  $C$  prevents any event of  $W_{\text{after}}$  from causing anything inside  $B_{\text{after}}$ . This does not mean that  $B_{\text{after}}$  is isolated from the environment as a whole, which is  $W_{\text{before}} \cup W_{\text{after}}$  but rather that  $B$  is isolated from a portion of it – i.e., by  $W_{\text{after}}$ . It is worth remembering that nothing prevents slower-than-light causal processes from occurring inside the light cone.

Finally, let me stress again that the suggested argument does not apply only to this case, but rather expresses a general rule that holds for all cases of perception. At any time  $t$ ,  $B_{\text{after}}$  is *always isolated from what happens at that very time  $t$* . When a brain perceives the events in its surroundings (a face, a constellation, a sound), it cannot perceive the events occurring at exactly the same time  $t$  in which the neural activity takes place. A subject perceives an environment that is always in the past of the subject's light cone. The external world we perceive and live in, in physical temporal terms, is our past. If we persisted in claiming that our environment takes place at the same time as the corresponding neural brain activity, we would face solipsism.

For simplicity, I propose calling the events inside  $W_{\text{after}}$  the *synchronous* environment and those defined by  $W_{\text{before}}$  the *actual or spread* environment.  $W_{\text{before}}$  is the actual world. The synchronous environment is composed of events taking place at time  $t$  in close spatial proximity to the agent at time  $t$ . Yet, so defined, the synchronous environment cannot have any causal connection with the agent at time  $t$  since infinite speed would be needed. On the other hand, the extended environment of an agent at a time  $t$  consists of those events that have a causal influence on the agent at time  $t$ . Because of the speed limit of causal processes, these events



occurred at earlier times  $t^* < t$ . There is no limit as to how much earlier they can take place. The environment we live in is more spatiotemporally extended than it is usually assumed to be.

The apparently intuitive notion of synchronous environment is physically elusive and prone to ambiguities. The revised notion of environment specifies the causal and temporal surroundings of any event. The actual environment is thus a relational notion –  $x$  belongs to the environment of  $y$  at a time  $t$  only if  $x$  is the cause of an effect in  $y$  at a time  $t$ ; necessarily, then,  $x$  occurred at some time  $t^* < t$ .

The persistent and widespread idea that the environment is synchronous is probably due, among other reasons, to the fact that in everyday life many causal processes occur so fast that they are almost instantaneous. At short distances, sound and light seem to produce instantaneous effects. Touch, taste, and smell are relatively fast, too. In these conditions, it is difficult to visualize the temporal extension of the processes in which brains are entangled.

To recap, the synchronous environment, which is the commonsensical notion, is physically untenable. A better option is a spatiotemporal extended environment defined in causally relative terms. The present – call it the extended environment or actual world – is the set of all those actual objects that produce an effect.

The present is thus a relative notion. The present is an actual object relative to an effect, which is an event. In other words, each event has its own present, which is nothing but an actual object (or a set of actual objects). *The present of  $x$  is what  $x$  brings into existence.*

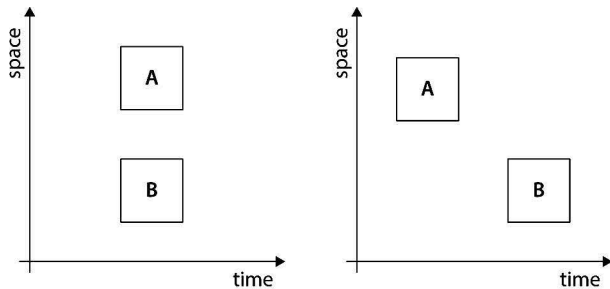


Figure 8. Not synchronous events (left), synchronous events (right)

## 6.4 Temporal unfolding

The notion of a spatiotemporally extended environment, which is the actual world, requires some revision of our commonsensical notion about the present but – I am confident – matches better with our experience than more traditional notions. A few examples will help to grasp the gist of the idea.

Emily takes a stroll under the Sun. Suppose that Emily is isolated from her surroundings by a special helmet during an interval  $T$ . Her brain is disconnected from the light reaching the helmet during  $T$ . Consider now another interval  $T'$ , consecutive to  $T$ . During  $T'$ ,  $S$  is freed from the helmet.  $T'$  is less than eight minutes. Given the limit of lightspeed, during  $T'$ ,  $S$  sees a Sun that does not belong to  $T'$ . The photons that Emily perceives originated on the solar surface during the time in which Emily was wearing the helmet. So, if Emily's environment were the synchronous environment, Emily would perceive something that does not belong to her environment. Since this conclusion is absurd, Emily's environment is not the synchronous environment but rather the extended environment.

Consider a time bomb. Emily sets the timer so that the bomb is going to explode in a few days. Emily is the only one who knows when the bomb will detonate. Subsequently, Emily takes the bomb away with herself. Emily completely isolates the bomb from the environment, putting it inside a lead-shielded box on a desert island. The surroundings of the lead box cannot modify what is going on inside the bomb. No radiation, no soundwaves, and no electronic signals can get through the many-inches-thick lead walls of the box. After a few days, unsurprisingly, the bomb explodes, thereby destroying its box and the island. What or who was the cause of the explosion?

Clearly, at any time  $t$ , the bomb is isolated from its synchronous environment. Therefore, either the cause is the bomb itself or the cause is something that took place before Emily took the box to the island. If Emily had set the timer for Friday, the bomb would explode that day. If Emily had chosen another day, so it would be. In short, it seems fair to say that the relevant event is Emily's setting of the timer. After all, if Emily had set the timer to explode at the very moment you park your new car next to the bomb at any subsequent time, wouldn't you blame her for the disaster?

So, when Emily puts the bomb in the box, the bomb is isolated from its synchronous environment. Yet, the future of the bomb is the result of what happens earlier. The proposal is that the real environment of the bomb is the set of events that have a distinguishable causal influence on the bomb at that time – i.e., the actual environment. Difficult as they could be to single out, it is simple to set aside those that belong to the synchronous environment and that, because of their synchronicity, cannot have any causal influence.

When the bomb gets isolated from its synchronous surroundings, the past events in the light cone of the bomb are still the causes of the forthcoming explosion by means of the physical structure of the bomb. One such causal and physical process, supported by the timer inside the bomb, is ticking towards its predictable effects. Isolation preserves their influence undisturbed by external factors that could disrupt them. *Thoughts and memories are like the causes of a time bomb.*

Consider a computer. Suppose the computer receives inputs only by means of a keyboard. Anytime you press a key, the corresponding ASCII code is sent to the memory of the computer. Here, a very simple program takes the values received and displays them on a screen. Indeed, word processors do the same. Although it could seem like a straightforward causal process, it is only so with respect to human sensorimotor processing – you press the key and then you immediately see the character on the screen. Yet, between the two moments, several intermediate electronic steps take place. If your perceptual response were quicker than the time required to send the signal from the keyboard to the screen, such a feeling of immediacy would disappear.

Consider now a slightly different program that cycles  $N$  times before sending the characters to the screen. If  $N$  is big enough, you press the key and, after some time, you see the character on the screen. What is the cause of the screen output? In some sense, the cause is the last flick of a switch inside the computer before the character is displayed. Yet, the real cause is the key pressed by you on the keyboard. Yet, the key has already been pressed many times earlier. Should we reject the obvious fact that the cause was the key pressure? I don't see why.

Now, consider a program so complex that it would be very onerous to trace back any output to the corresponding input. In a deterministic world, aren't all the computer states functions of previous inputs? Every program has once been an input. So, from this point of view, a computer is very much similar to Emily's time bomb. However, the computer does not have only one switch and one timer – rather, a computer has millions of switches and several timers. The causal chain between inputs and outputs is longer and more complex than the one in the bomb – but it is a causal chain nonetheless.

Let's discuss the three cases. In the simplest case (Emily's stroll), there is a small delay between the input and the output. Besides, the causal relation is simple. In such a case, no one would consider the system isolated.

In the second case (the time bomb), the delay between any input and its output gets longer and longer – the greater  $N$ , the larger  $\Delta t$ . In Emily's time bomb case, it may be arbitrary long. The system is no more isolated than it was before. However, if the observer's timescale is short enough, the observer will have the illusion that the system is isolated. In fact, nothing that happens in a shorter time interval seems to have any effect. Suppose that the minimum delay between input and output is longer than the length of a typical window of observation. One may conclude that the system is producing an autonomous response since it is impossible to observe the original cause. Since the input has not been observed, the output is wrongly supposed to be caused by some internal activity. Of course, there is always some intermediate activity, even in the most favorable conditions. Yet, it is only a matter of epistemic capacity. It is not a matter of causal connections.

Finally, in the third case (the complex and slow computer program), the causal chains between input and output are temporally longer and more complex. Not only can the causal chains take a very long time, but they are also very complex and intertwined to the extent that it is almost impossible to determine what the original cause was. Yet, the argument is the same. Every output is still the outcome of some previous input, or any combination of inputs. If an observer had infinite epistemic power and unlimited time, all causal chains could be traced back and there would be no substantial difference with respect to the time bomb.

The last case is akin to the allegedly autonomous activity in the brain. Since the causes of the current brain activity occurred in the past and are difficult to ascertain, it is easy to dismiss them and to focus on some intermediate internal neural activity. However, the brain is no less connected with the actual environment during recollection or dreaming than during perception. During dreams, the neural activity involved is the result of past stimuli. Neural structures are the result of development, too – they play a causal role akin to the program code in the computer example. Even if the brain is apparently disconnected from *current* inputs, neural activity is still the result of previous causal interactions with the environment. What else can be the cause of it? To the best of our knowledge, there are no pristine original causes inside our brains. So what the brain dreams of is the result of past sensory inputs. The only difference with everyday perception lies in the length and the complexity of the causal chains involved. After all, in normal perception, too, intermediate physical activity occurs between the external world and the final neural or behavioral output.

The conclusion from all these examples is that a longer time span does not entail increased isolation between physical systems – rather it shifts the causal environment backward. It appears that either a temporally longer causal chain or a very complex one, or both, has often been mistaken for cases of isolation.

Once it is understood that the environment of a system is its actual environment, which is a set of temporally antecedent events both in dreams and in normal perception, it is clear that no system can be isolated from the causal influence of events that have already occurred and are already embedded in the causal history. The channel shuts down the causal connection onwards from the moment it is put into use, but it can never shield from the existing causal connections inherited from the past. *Nothing can shield us from our past.*

## 6.5 Causal simultaneity

Consider the temporal and causal nature of the physical world. Everything takes time to complete. Everything takes time to connect. Adjacent neurons need a handful of

milliseconds to interact because of the chemical activity. Light speed limit dictates that nothing that is distributed in space can be instantaneous because nothing can move instantaneously between two distinct points. This implies that whenever there is a difference in space there is also a difference in time –  $\Delta x$  implies  $\Delta t$ .

The above conclusion might appear trivial and inconsequential. Yet, it can be generalized to all facts of life and offers a radical change of perspective. For one thing, it tells us that any two events are not simultaneous *per se*, but because they interact later with a further event, as special relativity suggests (Davies 2005; Peacock 1992; Einstein 1916). Let me provide some examples to clarify the matter. Suppose two events occur: two powerful bursts of visible light, so strong that they can both be observed by the naked eye from the Earth's surface on a summer night – A is on the Moon, and B is on Jupiter. Let's assume that I see the two bursts at the same time and, to all intents and purposes, they happen at the same time with C, the effect in my body. However, the burst on the Moon took roughly 1 second to reach my retina while the one on Jupiter took, say, 30 minutes. Thus, A and B were not simultaneous *per se*. They only become simultaneous with respect to a human being's body afterwards.

Being simultaneous is a matter of causing some further events to occur together. It is not a matter of taking place at the same time. Being simultaneous implies being in the same present and the present is always singled out relative to an event.

In practice, there is always an abundance of effects, particularly for physical events that take place relatively close to each other. Such an abundance allows us to ignore the importance of actual causal relations in order to flesh out the structure of the present.

Moreover, the speed of causal processes is usually much greater than the speed of our neural processes. In many circumstances, everything that partake to our present is actually taking place in a time span very close to the moment in which the corresponding neural activity occurs. In other words, in our everyday life, everything I perceive is only a few milliseconds away from my neural activity. In the worst-case scenario, it is a few hundred milliseconds away.

This typical short time span of causal processes is consistent with the belief that the present is almost punctual, or very brief. In summary, commonsense suggests that everything that happens more or less at the same time is in the present. This is both vague and empirically false.

Further more, the notion of a punctual here and now is wrong because, if it were true, the world, as we know it, would fall apart. Everything will be separated by everything else because nothing will have enough time to reach anything else. My brain activity would be in a different present than the external object. The neural activity in my fusiform gyrus would be in a different present than the signals in

the retina. Each spike would be in a different present than the ensuing spike. Not even neural firings could fit into a punctual present.

The punctual present is a vague notion since there is no physical law dictating why the time span of the present should be less than a certain value. In fact, either the present is punctual or it isn't. If it wasn't, it should be smaller than a certain  $\Delta t^*$ ,  $\Delta t < \Delta t^*$ , but why should there be a critical value? Why should  $\Delta t^*$  not be arbitrarily large – 10 milliseconds, 100 milliseconds, 1 hour, 1 day, 1 year, 1 billion years? Why should a certain amount of time be any better? Nothing in physics dictates a minimal time span. Thus, the notion that the present is *more or less* what happens now is irredeemably vague.

In fact, it is not only vague from a temporal perspective, but it is also vague from a spatial perspective. How large is one's here and now? Is my room part of my here? It seems so. Is my building part of my here? Well, this does not seem so obvious. In fact, including inside my *here and now* what my neighbors are doing right now seems a little bit rude, not to mention impolite! And surely what is taking place on the other side of the town does not seem to be part of my *here*. Yet, somehow, when I was walking with my children and pointing at Ursa Major in the starry sky, the constellation, while unfathomably farther off than my neighbors' private rooms, seemed much more naturally part of my here and now. Or, to stay on the Earth, when I am walking across the Harvard Bridge between Cambridge and Boston, the whole Charles River and its banks seem to partake in my present, together with the Sun, the clouds in the sky, the MIT dome, and the not-so-distant Prudential Tower.

Thus, it seems that both *here* and *now* are not punctual. They are quite variable and seem to extend at will based on one's interests and purposes. In practice, a simpler notion will suffice. The present is a causally relative notion. The present is relative to an event. The present is the set of causes that have an effect relative to my body. Thus, the amount of time or space that keeps our body and some other event apart does not matter. The only thing that matters is the occurrence of a causal relation between two events.

Our everyday perception is not made of synchronous events. Rather it is a patchwork of different objects and properties located at different timescales. This should not surprise us. On the contrary, it is a basic fact of experience and perception. In fact, it is a notion akin to Bergson's duration, James's specious present, and Einstein's relative simultaneity (Bergmann 1960; Pockett 2003; Power 2011; Gale 1971; Bergson 1950; Einstein 1916; Jackson and Pargetter 1977). In this regard, Whitehead wrote (*italics mine*, Whitehead 1920, 187):

Our observational 'present' is what I call a 'duration'. It is the whole of nature apprehended in our immediate observation. *It has therefore the nature of an event*, but possesses a peculiar completeness which marks out such durations as a special type of events inherent in nature. *A duration is not instantaneous.*

The “peculiar completeness” he refers to is here absolved by the joint effect that brings a whole into existence. Poignantly, Whitehead emphasizes that the present is not instantaneous and that its scope is extended because of certain temporal limitations. Moreover, he points out that the present has the nature of an event.

The proposed notion of the actual world suggests that the object our experience is identical with is, at any time, a complex and extended spatiotemporal collection of objects/events. Is this a nonstarter? I do not see why. In fact, traditional mind-body identity theories and, by and large, neuroscience have always proposed that experiences is identical with complex and extended spatiotemporal collections of objects/events – i.e., neural activity is extended both in time and in space. Is there any real option for a physicalist? The fact that neural processes are completed inside the skull and are made of biological material cannot make any fundamental difference. The notion that a physical process, spatiotemporally scattered, is unified because it takes place inside the skin envelope is irredeemably parochial.

Standard neural processes spread over hundreds of milliseconds. Their neural rigmaroles stretch, synapse after synapse, for tens of meters inside neural branches. Thus, one should accept that it is a fact of nature that physical phenomena are spread in time and space. How much spread can they be? Since there is no necessary physical threshold – 100 milliseconds, 100 seconds, 100 years – the amount of time is arbitrary. Thus, I suggest that the only criterion is of a causal nature. *Nature carves itself at its causal joints*. It does not matter whether the photon that caused an effect in my retina was emitted 1 picosecond ago on the nearby apple or 127 years ago on one of the stars of Ursa Major. What matters is that the photon emission was the cause and the retina rhodopsin release was the effect. It is the causal manifold of nature that defines how nature portions itself.

If that is the case, one’s brain will never be isolated from the actual world that is one’s experience, no matter how much time has elapsed since such a world was the cause of changes in the brain structure. This perspective challenges the standard view, which maintains that the brain becomes isolated as soon as you shut down your eyes, put some earplugs on, or deprive yourself of tactile, olfactory, and gustatory input. Although most perceptual content is related to distal stimuli, the received view focuses mostly either on proximal stimuli or even on the incoming information. Therefore, internal brain activity is usually portrayed as the effect of surrounding external events only, and consciousness has to be the result of some internal activity alone.

Memory, imagination, and perception are only different ends of the same spectrum of phenomena. An actual object exists relative to the effect it causes somewhere else and at a later time. The red apple exists because it produces an effect in my brain. The world that surrounds my body exists for the same reason. By and large, everything exists because it produces an effect.

Now, I ask you to invert your perspective. Rather than starting from the cause and going forward towards an effect, consider the other way around. Whatever happens is the condition for something else in the past to be brought into existence. Whenever something happens in our brain it fixes its cause – no matter where and when it occurred. Sometimes, its cause is in the proximal past, as is the case of the apple; sometimes, its cause is in a steadily more remote past; sometimes, it is something that happened a few hours ago or many years ago, or, as in the case of the constellation, hundreds of years ago. It is the structure of the brain that allows remote events to be fixed by the current activity of the brain.

If the actual objects that belong to one's actual world are temporally nearby to the effect in the body, it is customary to call those experiences perception. If the actual objects are temporally farther off, there are two more possibilities – either the causal process is manifest or the causal process is disguised because of neural rigmaroles. The former case corresponds to astronomical objects like the Sun, the planets, and the constellations. Cases of the latter are usually called memories, dreams, or hallucinations. Yet, there is no need to invoke an ontological chasm. Such events are not mental. They are as physical as the apple in front of us.

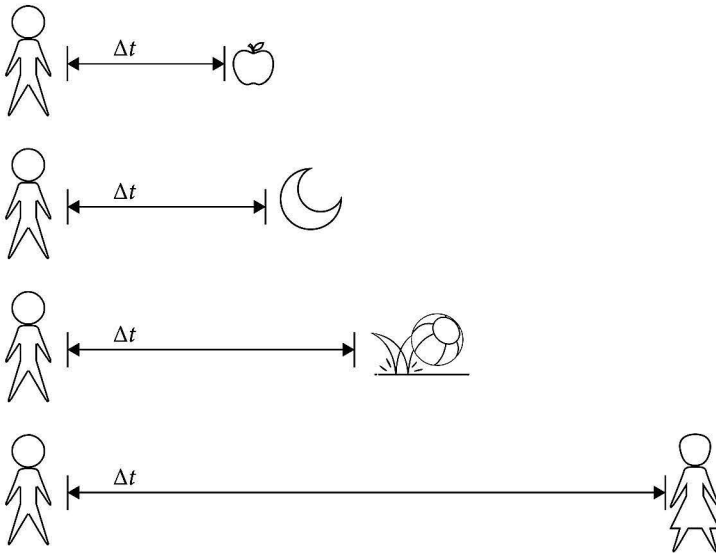


Figure 9. All experience is perception at different timescales

The difference between the apple and something that occurred at a more remote time is only quantitative – the amount of time between the external event and the effect in one's brain. Ontologically and physically, though, there is no difference



between the two cases. And the same conditions would apply even for a die-hard mind-body identity theorist, because time spans and distances hold between neural firings too. This is to say that if a skeptical reader tried to reject my hypothesis by appealing to the spatiotemporal separation between external causes and brain effects, I would object that there are spatiotemporal gaps between consecutive neural firing and adjacent neurons. The skeptical reader will then be obliged to show some fundamental difference between synaptic ‘gaps and hops’ and everyday causal ‘gaps and hops.’ I don’t see any.

## 6.6 Present and past are relative

Can you grab a fly? Probably not. The reason is not that your body is not fast enough, but that the fly you see is always in the past. It is a deficit in your experience rather than in your motor skills. In fact, the velocity of the fly is such that the human perceptual time delay is insufficient to see the fly where it actually is. The fly we see is always the 300-milliseconds-ago fly. It is a bit like when we watch a far-off star. A time span keeps both the star and the fly – and everything else, as a matter of fact – separate from the corresponding neural activity. The fly is, to a certain extent, more surprising because it is so close. Because of its velocity, the brief time delay is enough to prevent us from catching it. *Yet we see flies like we see stars – in delay!*

The world we perceive is in the past with respect to our bodies but not, crucially, with respect to our experience. In many senses, our bodies are one step ahead of us. We are one step behind. This should not come as a surprise since we are the object that is brought into existence by the occurrence of an effect inside our bodies. We are not the effect; we are the cause. We are not the body; we are the object. The cause is always earlier than the effect, which is a tautological statement, of course. For how could we distinguish a cause from an effect if not by pointing out which comes first and which comes later?

Anyway, when we watch the fly we are, a bit repulsively, the fly. Crucially, we are the fly at the time when the fly was the cause of the ensuing and current activity in our brain. In the case of the fly, we are the 300-milliseconds-ago fly. In the case of the star, we are, say, the 128-years-ago star. Everything we are is not synchronous with the time in which the effect in our body is completed.

Thus, why do we find it so natural to distinguish between present events and past events? The main reason is that *the distinction between past and present is relative to our body and to the goal we are pursuing.*

For instance, consider a simple event – the bell tower striking ‘one.’ I work very close to the bell tower, a few dozen meters away. The sound is strong and, according to my experience, synchronous with the physical stroke inside the bell tower. In contrast, you stand 1 mile away. As a result, you hear the bell three seconds later

than I do. It means that the bell is part of your present 5 seconds after it is part of mine! Emily lives 10 miles away. The bell is part of her present 50 seconds later! Supposing that the bell is loud enough, one might move faster than sound and have the bell in her present at any subsequent time.

In practice, this is impossible because the intensity of sound waves decreases proportionate with the square of the distance. However, one might devise sound waves that do not follow the inverse square laws. In such a way, if one moved fast enough, one could always keep something as part of its present. Or, alternatively, if one was already far enough (Figure 10).

In brief, the same event, the bell, might be in your present (1 mile from the bell tower) and in my past (I work next to it). And it might not yet be in Emily's present. Thus, as mentioned above, this is all well-known at least since Einstein's analysis of simultaneity as a relative notion (Jackson and Pargetter 1977; Peacock 1992; Einstein 1916). Here the emphasis is on non-relativistic processes, like everyday causal processes. The point I want to make is that such a notion of relative present (and past) does not require any of the sophistication of Einstein's relativity – causal processes with a finite speed are all that is needed.

In practice, the main reason to put something either in the present or in the past is of a practical nature. An event/object is taken to be in our present if we are confident that our body can reach it after we perceive it. For instance, the apple on the table is taken to be in our present because we are quite confident that we can stretch our arm and grab it. However, if the apple were fast moving, like the fly, the apple would recede into the past. Yet, it cannot be that an object is either in the past or in the present because of how fast or how unpredictably it moves. The fly and the apple, when seen from the distance of a meter are both in one's present.

Likewise, if something moved slowly enough and one had superfast devices, phenomena that commonsense puts in the past would appear in the present. For instance, suppose you were to strike a super-slow snail creeping on Mars. If you were equipped with a powerful laser, you may conceive to track the target in your viewfinder and then shoot. You might even envisage slowing down your cognitive processes so that their reaction time was comparable to the time needed for light to arrive from Mars (say 15 minutes) and for your laser to reach your target. In such circumstances, the time coarseness would be around half an hour. Yet, while the situation would surely be different from our everyday experience of the world, no natural law would be broken.

The timespan of one's present is thus relative to one's body. Because of our neural structure, the span of human beings' present is a fraction of a second. It may vary because of age, sex, and other physical conditions. The span of bats' present, flying in an enclosed space, is shorter. A bumblebee's present is even shorter. The span of the imaginary cognitively slowed-down human shooting at the Martian snail would be half an hour. Yet, any such present is a possible one. And none of

them is any better. *The time span of the present is relative to the causal structure of the body relative to which it produces its effect.*

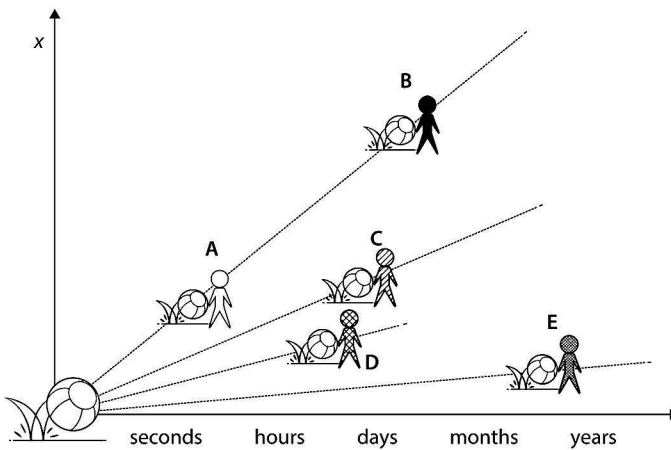
All these examples link distance and time because causal processes propagate through space at a fixed speed. The same rational will hold if one considers causal processes that do not move in space but that propagate the causal influence of phenomena through time – e.g., a timer.

The point is that the past and the present are relative to an effect. They are not metaphysically different. They are both moments of existence that get fixed by the effect they will produce at a later time. The same hypothesis has been courted by the late physicist John Wheeler (Wheeler and Zurek 1983). Wheeler's hunch is that the universe is built like an enormous feedback loop in which what happens now contributes to the ongoing creation of the present and the past. He suggested proving such an insight with what he called the delayed-choice experiment – a cosmological version of the classic two-slits experiment. The two-slits experiment illustrates the dual nature of light. In the experiment, light – a stream of photons – is shot through two parallel slits and hits a strip of photographic film behind them. The experiment can be carried out either with photon detectors right beside each slit, or without detectors. With the detectors in place, every photon is observed to pass through either one slit or the other. The photons, in other words, act like particles. Without the detectors, the photons produce an interference pattern as though they were waves. Thus, it seems as though the nature of electrons depends on whether they will be detected or not.

Anyway, Wheeler devised a version of the experiment at a humongous scale. He suggested considering a couple of quasars, some astronomers on Earth, and a galaxy in between. The astronomer's telescope plays the role of the photon detector in the two-slit experiment. If the astronomers point a telescope in the direction of one of the two intervening galaxies, they will see photons from the quasar that were deflected by that galaxy; they would get the same result by looking at the other galaxy. But the astronomers could also mimic the second part of the two-slits experiment. By carefully arranging mirrors, they could make photons arriving from the routes around both galaxies strike a piece of photographic film simultaneously. Alternating light and dark bands would appear on the film, identical to the pattern found when photons passed through the two slits. Here's the odd part. The quasar could be very distant from Earth, with light so faint that its photons hit the piece of film only one at a time. But the results of the experiment wouldn't change. The striped pattern would still show up, meaning that a lone photon not observed by the telescope traveled both paths toward Earth, even though those paths were separated by many lightyears. And that's not all. By the time the astronomers decide which measurement to make – whether to pin down the photon to one definite route or to have it follow both paths simultaneously – the photon could

have already journeyed for billions of years, long before life appeared on Earth. The measurements made now, says Wheeler, determine the photon's past. In one case the astronomers create a past in which a photon took both possible routes from the quasar to Earth. Alternatively, they retroactively force the photon onto one straight trail toward their detector, even though the photon began its journey long before any detector existed.

Wheeler's cosmic experiment is not just a curious thought experiment: in 1984, physicists at the University of Maryland set up a tabletop version of the delayed-choice scenario and demonstrated it. Using a light source and an arrangement of mirrors to provide a number of possible photon routes, the physicists were able to show that the paths the photons took were not fixed until the physicists made their measurements, even though those measurements were made after the photons had already left the light source and begun their circuit through the course of mirrors.



**Figure 10.** The same event is present relatively to different objects and subjects at different times

Wheeler conjectures that we are part of a universe that is a work in progress; we are tiny patches of the universe looking at itself – and building itself. It's not only the future that is still undetermined, but the past as well. And by peering back into time, even all the way back to the Big Bang, our present observations select one out of many possible histories for the universe. Wheeler suspects that most of the universe consists of huge clouds of uncertainty that have not yet interacted, either with a conscious observer or even with some lump of inanimate matter. He sees the universe as a vast arena containing realms where the past is not yet fixed.

Wheeler provided such an insight in the context of quantum mechanics and focused mostly on quantum mechanical classic phenomena. Yet, the framework presented here suggests that the notion of relative existence is much more general. We do not need to consider only electrons and photons, since everyday macroscopical causal processes single out their causes all the time. The key fact is the contingent nature of effects that may or may not occur. When an effect occurs, a whole lump of reality gets fixed – such a lump is spread in space-time and is what we call present or past, depending on our personal interests.

## 6.7 Time lag debunked

There is a recurrent argument against direct realism in the philosophy of perception – the time-lag problem (Power 2010; Dolev 2007; Myers 1957; Suchting 1969). Basically, the argument goes as follows: since there is always a delay between the external object and the neural activity, the external object cannot be the object one perceives because, in principle, it might have been destroyed at the time of the neural activity. A nice formulation of the problem was provided as early as Leibniz (Leibniz 1704):

Since rays of light take time (however short it may be) it is possible that the object should be destroyed in this interval and no longer exist when the ray reaches the eye, and what no longer is cannot be the present object of sight.

The same problem has recently been addressed by J. J. Valberg as regards the causal theory of perception (J. J. Valberg 1992, 15–16):

Everyone [...] knows he has eyes and a brain, and that light is reflected from objects and then travels to his eyes, and that because of what happens after that – because, i.e., of what happens in the nervous system and brain, he then has the kind of experience he then has [...] if the activity in my brain could somehow be held constant, the earlier parts of the causal chain might somehow be eliminated without this having any effect on my experience. [...] Consider the hypothesis that halfway through the last five seconds God intervened in the manner we have described: God eliminated the book but maintained the activity in my brain just as it was when the book was there. What follows? It follows (plainly) that this object, the object on which I have actually been focused for the last five seconds, is not the

The problem and its various formulations have generally sounded rather convincing. How could an object that does not exist (or that might not exist) any longer be the object one perceives? The object must exist at the time in which I perceive it. Using the arguments we have so far been developing I believe we can address the issue.

To begin with, the object one perceives is never the object that exists at the time when the neural activity completes. I see an object that is already in the past.

Thus, not even God might destroy it, since it has already elapsed. Unless God had the power to change the past, the object has safely taken place in its own time. I see the past object.

The book I perceive is not the book at time  $t$  when the corresponding neural activity takes place, but the book at time  $t - \Delta t$ . God destroys the book at time  $t$  but such an act is immaterial for the book at time  $t - \Delta t$ . To be effective, God should destroy the book at time  $t - \Delta t$ .

The time-lag issue is solved by the mind-object identity theory thanks to the conceptual twist advocated – *one's experience is not at the end of the causal chain but at the beginning*. At the end of the causal chain there is no little homunculus to be reached. There is no subject waiting to get the mail from the external world. The brain is not the mind. The mind is the object itself. One's experience is not *after* the time delay the light takes to reach one's eye ("however short it may be"). One's experience is the object at the beginning of the causal chain *before* the light started.

When we look at a red apple, the thing we are is the red apple, wherever and whenever the red apple took place when it reflected the rays that reached our body a few picoseconds later. When we stare at a faraway star, the thing we are is the faraway star, wherever and whenever the star took place when it emitted the rays that reached our body hundreds, if not thousands, of years later.

The difference between a few picoseconds and a thousand years should not scare us. As I stressed repeatedly, the length of the time span of the present is only a parochial difference set by our practical interests. The star is out of reach; thus, it is in the past. The apple can be grabbed and bitten; thus, it is in the present. Yet, if the apple were moving superfast, like a fly, the little delay would be enough to put it in the past too!

The time lag aka time gap aka Valberg's puzzle is solved by placing experience at the beginning of the time delay rather than at the end. Experience and its object are no longer detached (Figure 11).

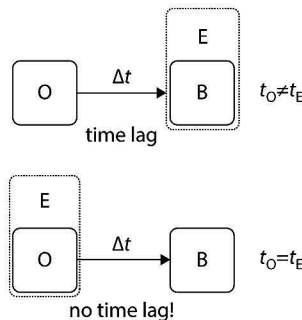


Figure 11. Changing where and when experience is solves the time-lag issue



## CHAPTER 7

### All experience is identity

[...] *music that is heard so deeply that it is not heard at all, but that you become the music while the music lasts.* (T. S. Eliot)

So far I have considered standard perception only – i.e., cases in which the object one perceives is actually there, be it an apple or a faraway star. Yet, everyday perception is only a subset of human experience. There are many cases in which what we perceive seems to be different from what exists. How can a mind-object identity theory cope with cases in which the object is either different or absent? Apparently, they ought to be mortal blows. Surprisingly, it is my contention that these cases can be easily accommodated once we use the notion of actual object in a causally and spatiotemporally extended environment. I will contend that misperception, dreams, hallucinations, and illusions – customarily deployed against realism – are the outcome of adopting, rather naively, the key notions I have tried to debunk – i.e., the naïve object and the punctual present. My main claim is that if one revisits these two fundamental notions, a different picture of nature will unfold in which our experience is no longer like Groucho. On the contrary, all forms of experience will find their place in the causal manifold of nature as different spatiotemporally extended actual objects.

Against the shortcomings of idealism and realism, the solution advocated here is both ontologically neat and compatible with the physical world – The subject is the object. The impossible leap between subject and object is no longer necessary once experience is reckoned to be identical with the perceived object. There is no longer any need to posit fancy mental theatrical objects, nor to seek impossible relations. The proposal is straightforward: *perceiving an object is being that object. Perception is identity.*

Yet, one will surely wonder about all the quirks and vagaries of experience and consider whether perceptual content has some degree of independence from physical objects. If we are identical with the objects we perceive, how can our perception change if the world remains the same? The answer I put forward hinges on the notion of the actual object – the object whose existence is relative to another physical object, which is a condition of its existence. The actual object, which is external to one's body, is identical with the experi-



ence. The subject, being made of such objects, is external to one's body, too. The actual object, crucially, is not immutable. It changes along with changes in one's body. Such a variability explains why our perception is so variable, because *the world we live in is continuously rehearsed in slightly different ways by the incessant changes in our bodies*. Yet, everything is physical; everything is causally carved out.

Placing one's perception in external (actual) objects allows us to leap over the *subject-object* gap (which, for a physicalist, should be the *object-object* gap). In a physical world, where each object is just what it is, there is no other solution. Brains are brains; apples are apples; clouds are clouds. *Everything is only one thing and not two things* (or, alternatives, one thing and almost another one). The traditional model of perception is like a ghost that has been manufactured to safeguard a wrong premise: the separation between the subject and the object (in the traditional mind-body problem) or the separation between the body and the object (in a more scientific version of the mind-body problem). Given such premises, all kinds of relations or vicarious entities (information, representations, mental models, mental images) had to be devised and employed to explain the unfathomable gap between the subject and the object. Identity between experiences and objects provides a much neater solution.

In sum, the point is that every experience is nothing but the perception of something and, in turn, that perception is identity with actual objects.

The mind-object identity theory allows us to translate the traditionally mysterious sentence 'a subject perceives an object' in purely physicalist terms. The sentence can be reformulated as a way to state that the body allows an object to take place and such an object is the very thing we call experience. Perception is a matter of identity. To perceive an object is to be identical with that object. No kind of contact is more intimate than identity.

After all, experience cannot but be identical with itself. If our experience were a neural process (or a property of a neural process), it would be identical with such a process. Then it would have its own properties, which unfortunately are different from those one experiences. It would be grey, gooey, and brainish. Yet, if our experience is a physical thing, why should it be different from all the other physical things we know of (namely, having the properties it has and only those)? Of course, if experience were not physical, then it might be anything it likes. But why should it not be physical? How could it not?

By and large, a broader rationale is that in all cases – everyday perception, dreams, illusions, hallucinations – the alleged gap between experience and reality is the conceptual offshoot of assuming an *a priori* knowledge about what reality ought to be. Thus, if I assume the object is the Galilean object, I will need to introduce a phenomenal character to explain the variability of sensor modalities.

Or, if I assume that the property I perceive is length *and* if what I perceive does not conform to length, the notion of illusion will be called to the rescue. In other words, if I adopt an overly simplistic model of the external world, I will need to introduce an elastic notion of experience to make ends meet. In this chapter, I will show that this is not necessarily the case.

Our experience is something *and*, like everything else, it has its own properties. A chair has length, width, weight, color, and shape. The Moon has radius, mass, albedo, and spin. An apple has color, shape, mass, and chemical composition. A brain has color, shape, mass, and chemical composition. Given a causal environment, everything is what it is. In a physical world, there is nothing but physical objects. The physical world is made of them. No additional entity is available or indeed necessary. If we consider standard perception, as when I perceive something that is manifestly where I perceive it, the identity hypothesis is straightforward – the thing that is my experience is the actual object.

What about more complex cases of experience, such as dreams, illusions, and hallucinations? I will proceed through a series of cases where the actual physical object – the thing I claim one's experience is identical with – appears increasingly difficult to individuate. My point will always be the same. Once the environment one lives in is no longer the overly simplistic proximal and instantaneous surrounding the layman takes for granted, the number of available actual objects is much larger. Actually, it extends to cover everything one is causally entangled with. Time span and spatial distance are no longer critical factors – if they were, they would rule out all versions of physicalism. All forms of experience can thus be revisited as perception of – and, thus, as cases of identity with – actual objects. The difference between perception and, say, hallucination, will no longer be a difference in terms of brain or mental activity, but rather a different role for the actual objects one perceives. Laymen and philosophers have deemed those objects one can interact with 'perception,' and all other cases 'memory,' 'dreams,' and 'hallucinations.' I will claim that the difference between perception and hallucination is not a matter of ontology, but a matter of practical interest. From modes of perception up to dreams and hallucinations, I claim that the argument from misperception has been so convincing only because it has hinged on three misleading premises: the separation between subject and object, the Galilean object, and the instantaneous proximal environment. Here I have substituted them with three new starting points: the experience-object identity, the (realive) actual object, and the actual environment. From such a different angle, I will show that all cases of experience are cases of perception and thus cases of identity with objects in the physical world.

### 7.1 Modes of perception

A popular belief is that the way we perceive something depends on some internal modality – loosely referred to as a mode of perception. The standard view is that when I perceive  $x$ ,  $x$ 's appearance seems to change according to what mode of perception I exploit. The look or the appearance of the object has always been deemed a function of the mode of perception. This may appear to be a counterexample to the identity between experience and external objects! If what one perceives depends on a subjective stance as a mode of perception, how can identity obtain? According to the standard view, we perceive differently the same object based on different modes of perception. The notion of mode of perception captures the idea that the same thing can be perceived in different ways and that the quality or character of such ways depends on the subject. Sensor modalities are an obvious example of such modes, although there can be subtler examples – e.g., shortsightedness, colored lens, periscopes, head-mounted display, sensory substitution devices. The notion is consistent with the subject/object and appearance/reality separations.

In fact, if reality appeared differently according to the whim of the subject, we would not perceive reality itself. Idealism would strike back. We would, once again, perceive only our own mental itches. Is there an alternative solution which is compatible with identity? Yes, there is.

Consider sensor modalities. As mentioned, in such a case, the solution is straightforward – *each sensor modality picks up a different actual object*. Thus, the premise that we perceive the same object under different sensor modalities is rejected. On the contrary, we perceive different objects and, for practical reasons, we lump them together under a common label. It is a purely conventional choice adopted because of its practical advantages. Thus, we do not perceive the same object, the apple, under the tactile or the visual sensor modality. Rather we perceive either *a tactile apple* or *a visual apple* – the two apples being different objects that, for practical reasons, we lump together. Two actual objects and one convenient naïve object. The circumstance is akin to the film frame example. The film is made of thousands of frames, which are the actual objects one sees, but one lumps them all together as though there were a continuous character on the screen.

There are many more actual objects than language can deal with. Whenever possible, it makes sense to lump them together, all the more so if commonsense suggests we should. How many times can you eat the apple? Once. Thus, the commonsensical conclusion is that there is only one apple. Yet, this is no more informative than the equally commonsensical conclusion that the ground on which our city is built is absolutely still.

Classic everyday objects are conventional labels clustering together convenient collections of actual objects. They do not pose any deep metaphysical mystery. They are labels that simplify the world we live in.

One does not perceive the ideal Galilean object. One perceives particular visual objects, or acoustic objects, or tactile objects, or visually blurred object, and so forth. Every time, the thing that is one's perception is a particular concrete cause.

Other cases, which are analogous to modes of perception, can be dealt with in a similar way. Amodal and supramodal perception are not critical, either – e.g., as when one perceives something that is shared by many different sensor modalities (Ricciardi et al. 2009; Weigelt, Singer, and Muckli 2007; Kiefer and Pulvermüller 2012; Davis and Driver 1994; Kanizsa 1985). In fact, they correspond to causal processes carving out properties shared by many different causal processes – e.g., shape. I touch the apple and one of the actual objects my experience is identical with is the shape of the apple. I look at the apple and the cause is the same. In brief, there are causes that can be carved out by different causal processes – i.e., different sensor modalities. Yet they are the same actual object that, by means of multiple causal paths, can exert its influence on our body. In the example, the actual object is the shape rather than the colored shape, or the textured shape, or the rugged shape: just the shape.

The mind-object identity theory allows us to set aside the specific energy-oriented attitude that still lurks in the neurosciences – i.e., the belief that the specific quality of each sensor modality is coated over neural signals by some internal power. Famously, such a notion has been defended by Johannes Müller, who suggested that each incoming signal gets its characteristic quality because of some specific energy secreted by the afferent nerves (Müller 1840). Thus, the signals received through the optical nerve acquire a visual quality because the nerve secretes that particular phenomenal character. The signals received through the acoustic nerve acquire an auditory quality, and so forth. Although, the hypothesis was quickly discredited, many neuroscientists still believe that the individual phenomenal character of each sensor modality is concocted inside the corresponding cortical area. Moving the alleged source of phenomenal character from the incoming nerves up to the cortical areas is not a substantial change. The problem is always the same. Phenomenal character is expected to be secreted inside the nervous system, but inside the nervous system there is nothing like phenomenal character.

The mind-object identity hypothesis solves the issue. There is no phenomenal character. There are only the physical properties of the object that is, at any time, part of one's experience. Each sensory modality picks up a different object.

Let's consider a related case: shortsightedness. I am in Florence and I take the afternoon off to pay a visit to the Uffizi. Now I am contemplating Botticelli's *Birth*

of *Venus*. I am a few meters from the painting and, from time to time, I take my glasses off. Since I am very shortsighted (6.5 diopters), without my glasses most details are lost. I can still see the pinkish silhouette of Venus, the shape of the shell, the horizon, and where Zefiro is floating in the air. Yet, everything looks blurred and confused. The individual brushstrokes are lost in a blended continuity. Yet, this does not mean I can't see a thing. I am in front of Botticelli's *Birth of Venus* and, even without glasses, I appreciate the masterpiece. What do I see when I take my glasses off? Is it a look? Is it a blurred image that does not allow me to see the real thing? Conversely, what do I see when I put my glasses on? Is that the real thing? Or is it yet another phenomenal veil hiding the real Venus? If I had a genetically enhanced retina with super-acuity, would I see a closer-to-truth Venus?

All these questions would make sense only if there were an absolute *Birth of Venus* – i.e., an absolute object independent of the rest of reality. Yet, according to the view presented here, there is no such a thing as an absolute object, and everything is relative. Thus Botticelli's Venus does not exist autonomously. The existence of the painting – and what the painting is – depends on which object it exists in relation to. Thus, in the above circumstances, the stuff hanging on the wall has two opportunities. The former is offered by my body with the glasses on. In such circumstances, the light rays arrive separately on the retina and the cause of the activity in my brain is made of many small details on the canvas. Let's call such an object the *focused Venus*. The latter is offered by my body without the glasses. In such circumstances, the light rays intermingle and partially overlap on the retina. As a result, the cause of the activity in my brain is different. Many small details overlap and coalesce into larger blobs. The cause of the activity in my retina is now different, as is shown by the fact that, if minute changes occur, they will not affect the object I am experiencing. They would if I wore my glasses, though. Let's call such an object the *blurred Venus*.

My experience is different, because the blurred Venus and the focused Venus are two different actual objects. *They are not the same object seen in two different ways, they are two different objects!* The differences charged to different modalities are mirrored and indeed amount to differences in the actual objects that one perceives. The blurred Venus is no less an object than the focused Venus. The differences in one's experience are differences in the external world.

Moreover, the focused Venus is not special. For instance, the focused Venus is the object that a standard human being is going to carve out. A better-sighted animal – e.g., an eagle or hawk – would see a much more detailed Venus. Let's call it the *super-focused Venus*. The focused Venus, the blurred Venus, and the super-focused Venus are all actual objects. None of them is any better. They are all at the same ontological level; they are actual objects that need a proper physical system to take place.

Rather parochially, human beings usually take actual objects relative to their average physical structure, e.g., the focused Venus, as though they were the absolute real thing. They are not. They are just objects among the umpteen possible actual objects.

From an aesthetic and cultural perspective, however, there is a privileged relative object: the actual object relative to a body as close as possible to that of the artist. An interesting consequence is that if one were to appreciate the painting of a shortsighted painter, one would need to be equally shortsighted. Only in this way would one be able to experience the same actual object the artist created.

In sum, *whenever we see something differently, we see something different*. The change is not in the appearance of what we see, but in what we see. The modifications along the causal chain (wearing glasses, alteration in one's sensory organs, drugs, neural activity) produce a change in what is singled out. If the object that is perceived is relative to the object that is one's body, every change in one's body changes the object that is picked up. *The change is not in the way in which the object is perceived but in the object that is perceived, thus in the object one's experience is identical with.*

## 7.2 A taxonomy for hallucinations

What about more extreme cases in which the departure between experience and reality seem absolute as dreams and hallucination? To address such issue, I believe it is helpful to devote a short section to the classification of hallucinations. This is important to get a grasp on what hallucinations are, rather than dragging along a dummy notion of them. Basically, the layman believes that hallucinations are a kind of unregulated mental state in which anything goes. They are assumed to be a condition in which people can experience anything their brains or their minds want them to. Empirically, this is both a misleading interpretation and a gross simplification.

As a matter of fact, things are not so simple and, as regards the present discussion, hallucinations can be clustered on the basis of their purported distance from reality. Certain hallucinations are very close to our everyday world.

For instance, if I hallucinated the chipmunk I saw a few months ago in Boston, it would be less amazing than if I hallucinated an animal I have never come into contact with. Likewise, it would be even more amazing if I hallucinated a color outside of my everyday color space or even something nomologically impossible in this universe. To cut a long story short – hallucinations are not all at the same ontological distance from the actual world. Apparently, some

of them are closer to reality. Of course, I will argue that real but I will get there gradually. Until here, it is tempting to classify hallucinations based on their distance from the hallucinator's actual world, as when Mendeleev categorized chemical elements even if he had no clue about their atomic structure. From the way in which they clustered together, useful inferences might be drawn. For instance, it might turn out that some of these classes are empty. If this were the case, it might be evidence that the connection between world and hallucination is not arbitrary.

Such considerations might help us to cast some doubts about the allegedly arbitrary capacity of the mind to create phenomenal content. Is it really the case that the mind (or the brain) concocts phenomenal experience out of thin air? I am aware that the recurrent reply from internalists is that brains need contact with the external world to grow the necessary neural pathways. Yet, this rebuke is only good for functional development. Why should neural pruning be any good to learn how to concoct phenomenal experience? Or phenomenal character? Moreover, we seek not a coherent and functional phenomenal world – sporadic, occasional, and isolated phenomenal content with no historical relation to the physical world would be enough. And, surprisingly, the unexpected appearance of novel phenomenal experience has never been reported in a definitive and convincing form. It is a remarkable absence that is all the more striking given the endless list of the things that can go wrong within a brain – e.g., diseases, strokes, seizures, intoxications, genetic alterations, and so forth. If the phenomenal world were a creation of the brain, why should the repertoire of phenomenal content be so thoroughly restricted to only those events and properties with which one's body has had physical commerce?

Experiences can thus be grouped together based on their degree of actual and possible causal contact with the corresponding properties in the external world:

- **P.** Perceiving things as they actually are – e.g., I perceive a red apple and there is a red apple.
- **I.** Perceiving something differently from what it is – e.g., I perceive a red patch and the patch is gray. This is a case of illusion.
- **H1a.** Experiencing things that do not exist when we experience them but that we have actually perceived elsewhere and at some other time – e.g., I experience a red apple and there is no red apple, but I've seen red apples in the past.
- **H1b.** Experiencing things that do not exist when we experience them but whose properties we have actually perceived elsewhere and at some other time – e.g., I experience a red apple and there is no red apple, but I've seen red objects and apples in my lifetime.

- H2. Experiencing things that do not exist when we experience them and that we have never experienced but that we *could* have experienced – e.g., I experience a red apple and there is no red apple. Furthermore, and improbably, I've seen neither red objects nor apples. But, if I had lived in California, I would have seen them both.
- H3. Experiencing things that do not exist when we experience them and that we have never experienced and could not have experienced – e.g., I experience the infrared nuance of the apple surface; I cannot possibly perceive infrared yet infrared is a real phenomenon.
- H4. Experiencing things that do not exist when we experience them, and that we have never experienced and cannot experience – e.g., I experience a nomologically impossible colored apple that cannot exist in this universe.

The crux of the matter is that it is an empirical issue whether any of these sets (P, I, H1a, H1b, H2, H3, H4) is void. We cannot take armchair conceivability as sufficient proof of their existence. One of the first things that jumps to the mind is that P, I, H1a, and H1b (H1 henceforth) have a causal chain linking experience with actual objects. The cases in which hallucinations seem to have no connection with the world are only H2, H3, and H4.

The mind-object identity hypothesis is incompatible with H2, H3, and H4. If any of these classes were not void, the mind-object identity theory would fail. This is a concrete prediction of the theory. Is the mind-object identity theory compatible with such cases? What about I and H1? Can the theory survive them? The proposed identity will stand only if I and H1 can be revisited in terms of perception.

In the following section, I will show that there are two kinds of hallucinations: good and bad. The good hallucinations can be revisited as cases of perception of unusual actual objects. The bad hallucinations cannot be revisited and, if they occurred, the mind-object identity theory would fail. The good hallucinations are H1a and H1b, while the bad ones are H2, H3, and H4. The good news is that there are no empirical cases of bad hallucinations. The theory puts forward a prediction that can be summed up as follows:

1. I is normal perception but fosters mistaken beliefs (thus  $I \subset P$ ).
2. H1 is perception (thus  $H1 \subset P$ ).
3. H2, H3, and H4 are empty ( $H4 = H3 = H2 = \emptyset$ ).

An empirical prediction resulting from these claims is that, during hallucinations and their cognates, one experiences only physical objects and properties with which one's body has gotten into physical contact with.



Regardless of the mind-object identity theory, H2, H3, and H4 are, ontologically speaking, much more demanding than H1. In fact, to cope with H1 in terms of perception, it is enough to show that there are cases in which perception stretches to encompass longer spans of space and time. H1 does not get out of the physical world and one's life. To address H2, H3, and H4, much more demanding empirical conditions are to be met – namely that what one experiences is independent of one's life or even of the physical world! This is not the case with H1.

Only H2, H3, and H4 would support the argument from hallucination. But are they real cases? In fact, is there any actual empirical evidence that anyone has ever had an experience of something one has never experienced before? It is usually claimed that there is, but is there any? If one had never seen a red patch, would one be able to imagine/dream/hallucinate such a red? This is – of course – the traditional philosophical conundrum of the missing shade of blue or, everything being the same, of Jackson's Mary. Yet, these cases, as stressed above, cannot be solved through armchair conjectures alone. Either there are actual cases or there are not – there has to be an empirical case on which to ground the whole conceptual construction of conceivability and the like. Our armchair intuition cannot help us here. Both Mary's red and Hume's blue are instances of H2, while the alleged case of supersaturated red would belong to H3. The point is whether any such cases have ever occurred. To the best of my knowledge, they have not.

Consider an alleged case of H2, Hume's missing shade – it has usually been held that subjects are able to concoct an extra shade of blue *in their own mind* (Hume 1758, II, 16):

Suppose, therefore, a person to have enjoyed his sight for thirty years, and to have become perfectly acquainted with colours of all kinds, except one particular shade of blue, for instance, which it never has been his fortune to meet with. [...] Now I ask, whether it be possible for him, from his own imagination, to supply this deficiency, and raise up to himself the idea of that particular shade, though it had never been conveyed to him by his senses?

Yet, holding such a belief does not guarantee that it is empirically true. At most, it tells us something about what we still do not know about color perception. More realistically, it tells us that we have no clue as to what is an experience of a shade of blue. In fact, apart from Hume's musings, is there any empirical evidence indicating that anyone has ever concocted a shade of blue through sheer will? Whether a certain shade of color can be experienced in the absence of any contact with objects of such a color is an empirical statement – as such, it ought to be backed up by empirical evidence. No level of armchair reflection can be of any help here. Hume's shade of blue should be ascertained experimentally. We cannot assume or presume anything about it.

Suppose that no empirical evidence is available; that no human being had ever imagined a shade of color without direct acquaintance. Well, such a lack of evidence would mean something! To say the least, it would point to some kind of necessary connection between experience and the real world. As a matter of fact, *pace* Hume, empirical evidence points in the direction of a lack of pure mental colors and hues:

1. If one could concoct an extra shade of blue, why can congenitally color blind subjects not complete their chromatic space through sheer imagination? Step by step and hue after hue, they ought to be able to form a complete color palette. They are not able to do this.
2. If one could concoct a shade of blue amidst other shades, why should one not be able to concoct extra shades of color at the boundaries of one's chromatic space? One might proceed in any direction. Still, no sighted subject has ever reported concocting extra colors.
3. The notion of the extra shade of blue is empirically unverifiable, since normal perceivers are exposed to all shades of color. It is not falsifiable.

It is fair to mention that, in the literature, there have been a handful of peculiar cases that are occasionally quoted as empirical evidence in favor of mental colors – most notably, supersaturated colors (Hurvich 1981), chimerical colors (Churchland 2005), and Martian or forbidden colors (Billock and Tsou 2010; Billock, Gleason, and Tsou 2001; Crane and Piantanida 1983). They do not. I will argue that they have been misinterpreted because scholars were biased by the assumption that one's experience is separate from the external world. They can be explained in terms of actual objects and differences in the external world.

In the next chapter, I will address the issue of the lack of empirical evidence supporting H2, H3, and H4. Here I will address only illusions and 'good' hallucinations (I and H1). If this effort has any merit, I will conclude that all experience is perception – dreams, illusions, and hallucinations included. In brief:  $(H1 \cap I) \subset P$  and  $H4 = H3 = H2 = \emptyset$ .

### 7.3 Hallucinations and dreams

As of Plato's cave, hallucinations have always been one of the philosopher's favorite battering rams to argue for the autonomy of appearance over reality. Hallucinations seem to show that experience can take place regardless of objects – e.g., Macbeth sees a dagger even though there is no dagger; I press my eyeballs and I see colored lights even though there are no lights.

As previously mentioned, hallucinations have been so influential that they have become the standard reference point for any model of experience – everyday perception included. This is a fair point. In both science and philosophy, it has become customary to explain perception in terms of hallucinations rather than the reverse, which is puzzling. In my opinion, it is more reasonable to start from perception and then proceed towards abnormal cases. After all, from an evolutionary perspective, perception is surely more fundamental than hallucination. Moreover, the hallucinatory-oriented explanation of experience does not provide any solution *per se* as to why experience should take place and be what it is. Postulating that experience is a form of environment-driven hallucination does not provide any clarification about the nature, the cause, and the role of experience. If anything, it adds mystery to mystery.

An equally persuasive force has been exerted by dreams. The dreaming brain is often presented as the paradigmatic case of an isolated physical system allegedly capable of producing consciousness. According to Attilio Revonsuo (Revonsuo 2000, 58):

The dreaming brain shows us that sensory input and motor output are not *necessary* [...]. The dreaming brain creates the phenomenal level and [...] provides us with insights into the processes that are *sufficient* for producing the phenomenal level.

Revonsuo is unambiguous. By the same token, Giulio Tononi and Christof Koch take as a platitude that (Tononi and Koch 2008, 50):

When we dream, we are virtually disconnected from the environment. We acknowledge almost nothing of what happens around us, and our muscles are largely paralyzed. Nevertheless, we are conscious, sometimes vividly and grippingly so.

If they are both right – if the dreaming brain were sufficient to create a full-blown phenomenal world regardless of the physical world – sensorimotor input–output and the world itself would no longer be necessary. Yet, this is an empirical issue. Are dreams really autonomous from the environment? The answer is no. The notion of isolation that Revonsuo, Tononi and Koch dwell on is based on a notion of proximal surroundings actual present, which is a far cry from the concrete reality. In the previous chapter, we have fleshed out a spatiotemporally extended notion of environment. Once the environment under consideration is the actual environment, the dreaming brain is no longer disconnected from the environment. The dreaming brain, i.e., the brain, is the causal outcome of a long story that begins in the external world at any time in one's life – just like everyday perception. The brain cannot be severed from the past, which is the causal present.

It appears that neuroscientists have not spotted the significance of two key facts: (1) the brain is always the outcome of previous interactions with the world – no matter how far off in the past; (2) there is no evidence that one can dream of anything whose constituents have not already been part of one's world. I addressed the first point in the section about the actual environment. As regards the second, dream content is surprisingly conservative as to what one actually dreams (Schwartz 2003; Cicogna et al. 2007; Kunzendorf et al. 1997; States 2000; Revonsuo and Salmivalli 1995; Llewellyn 2013). We dream of our previous life, albeit reshuffled.

The real environment we live in is spread across space and time and is carved out by causal processes rather than by temporal brackets. When we hallucinate a red apple and no red apples are available in the proximal surroundings, we conclude that we experience something that does not exist. It's easy to see the logical steps that lead from such an alleged empirical fact – experiencing something that apparently does not exist – to the experience/world apartheid. In fact, if one experienced an apple that does not exist, it would be tempting to hold that experience is indeed independent from the world. Moreover, since neural processes do not resemble apples, the widespread but troublesome view that there are three items – a vehicle (the neural process), content (the apple one experiences), and the object (the apple one grabs and eats) – seems very convincing. Still, such a view is based on the assumption that we know what our experience is and, crucially, what our experience is about. But here I will show that there is indeed an apple!

In fact, the traditional debate on hallucinations is based on two premises, namely: (1) S experiences O; and (2) O does not exist (Macpherson 2013). While there has been a lot of debate about the first premise – e.g., disjunctivism is based on its refutation (Byrne and Logue 2009) – almost no one has challenged the second premise. I take the first premise to be true, but I challenge the second one. I argue that whenever one experiences  $x$ ,  $x$  does exist. A caveat: my claim is that whenever we perceive or hallucinate something, there is an object, which is a physical object and not a Meinongian or intentional object. To be clear, I will argue that whenever one hallucinates an apple, the apple exists. O does exist. The rebuttal of the second premise – O does not exist – comes in two steps.

First, I note that, to the best of our knowledge, everything we dream or hallucinate is made of elements we have encountered before. Dreams and hallucinations can provide new combinations, but they do not concoct new elements. They are made of objects and properties that their dreamers have encountered during their lives. For instance, congenitally blind subjects neither dream nor hallucinate colors (Schwitzgebel, Huang, and Zhou 2006; Revonsuo and Salmivalli 1995; Kerr and Domhoff 2004; Hurovitz et al. 1999); Charles Bonnett patients hallucinate replicas of their previous lives, albeit reshuffled (Ffytche 2005; Hedges 2007;

Teunisse et al. 1996); Penfield's subjects hallucinate previous life episodes (Penfield and Rasmussen 1950; Penfield 1972); and so forth. In short, it appears that dreams and hallucinations are literally made of pieces of the physical world one has lived in. Hallucinations and dreams do not create new mental components, rather they recombine the properties and the things their world has been made of. *Hallucinations and dreams are chimeric.*

The traditional philosophical notion of hallucination fleshes out a phenomenon that has no necessary connection with the actual physical world one lives in – after all, that's the point of having a hallucination, isn't it? No, it is not. Empirical evidence points towards a different picture. If the actual evidence and hallucinators' reports are scrutinized, it is manifest that hallucinations and dreams are not arbitrary concoctions, but chimeric recombinations of the world subjects have lived in. Hallucinations are akin to a chimeric reshuffling of the physical world one lives in – they are not the outcome of an unconstrained mental generator.

A possible objection is that subjects would not know how to communicate such extraordinary experiences even if they had them. Yet, this difficulty is overestimated. In fact, if subjects had an utterly unexpected experience, they might still point out that their experience is *like anything they have ever perceived*. Such claims are unheard of.

Yet, a doubt is on its way – often one hallucinates objects, events, and properties that are no more. They were part of one's life but they no longer exist at the time of one's dream or hallucination. For instance, you dream of an apple today, but you ate the apple yesterday. Thus, the apple cannot exist at the time of your dream. To solve this obstacle, the second step kicks in – the spread present. Due to nomological speed limits, everything we perceive is – to some extent – in the past. The present is not what takes place at a given time, but rather is the set of events that causes neural activity at a given time. The present is what is causally present to my body.

In the case of standard perception, the object we perceive is taken to be there at the time and the place where we are. This picture is, clearly, a gross approximation. As a matter of fact, the object we perceive is never in the same place where we are. It might be a few inches or thousands of miles far off. I can look at an apple on my desk or I can look at the Sun or even at a faraway star. From a spatial perspective, the notion that the object is 'there' can be arbitrarily stretched. 'There' can mean something as far away as billions of miles.

Once the notion of 'there' has been stretched *spatially*, one might venture to stretch it *temporally*. In fact, due to the mentioned nomological speed limits (leaving aside pseudo-processes, Reichenbach 1971), every phenomenon extended in space is also extended in time. Thus, although most everyday phenomena are spatially close so that the time delay is huge, they are not synchronous either. In many

cases, the time delay is huge. A familiar object like the Moon is one second away from the corresponding neural activity; the Sun is eight minutes away; a star can be years away. In short, a temporal continuum can be envisioned.

In short, my rebuttal of the second premise is straightforward – whenever S experiences O, O is there, provided that the notions of ‘there’ and ‘now’ have been revised and stretched. Whenever we experience something – be it a standard perception, a dream, or a hallucination – to the extent that what we perceive has occurred at some place and time, the object is still the cause of one’s neural activity. Thus, the object may well be the thing that is identical with one’s experience, no matter when and where it occurred (Figure 12).

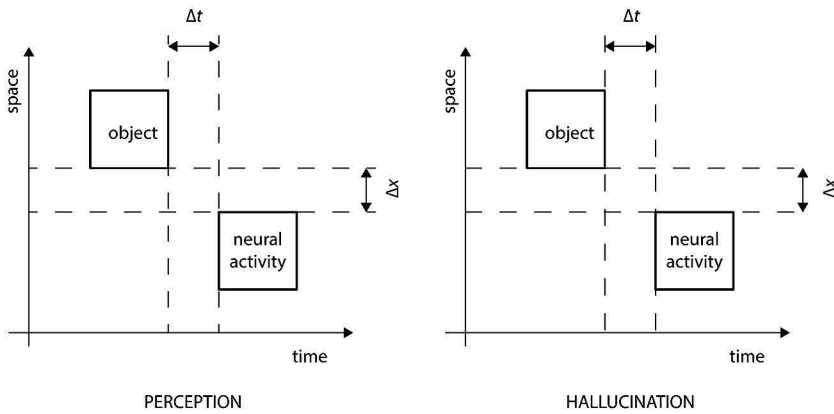


Figure 12. Perception vs hallucination. Spot the difference!

On the other hand, the standard view – albeit apparently more reassuring – is crammed with problems. In fact, the notion that one perceives only nearby objects is parochial and vague. How near should an object be to be near enough? There are not known valid thresholds. All objects and events occur at an earlier time than one’s neural activity. It is the time-lag problem once again. By nomological necessity, the external cause of everything that takes place in our brain is in the past. Such a past can be relatively near or very remote, as is the case with astronomical objects. Either way, though, *perception is never instantaneous*. And thus any object is always at the beginning of a process spread over a time span and across a spatial extension. Thus, a ‘close enough’ boundary is an empty notion. If stars and long-gone events are rejected as the causes of one’s memories, dreams, and hallucinations, by the same token, all everyday objects ought to be rejected. The traditional view limits one’s world to the very proximal shell that surrounds one’s skin and receptors, which is absurd. We do not perceive a thin layer of events enveloping our bodies. We perceive external objects wherever and whenever they are. Our

experience is identical to such objects whenever and wherever they are. Crucially, between perception and other forms of experience – such as memories, dreams, and hallucination – there is no structural difference.

To recap, traditionally, the argument from hallucination is based on two premises, namely: (1) S experiences O; and (2) O does not exist. Here I argue that the former is true, while the latter is false. Whenever S experiences O, O does exist! However, O exists where and when it likes, so to speak.

Likewise, dreams present us with unusual combinations but not with new elementary elements. Dreams are *chimeric* insofar as they create new objects by combining elements one has perceived before. The so-called bizarreness of dreams has been greatly exaggerated (Revonsuo and Salmivalli 1995; Cicogna et al. 2007; States 2000; Kunzendorf et al. 1997; A. J. Hobson et al. 2011).

Remarkably, Descartes himself recognized that imagination and dreams are unable to concoct truly novel stuff, only rearranging previous impressions (Descartes 1647):

How often has it happened to me that in the night I dreamt that I found myself in this particular place, that I was dressed and seated near the fire, whilst in reality I was lying undressed in bed! For, as a matter of fact, painters, even when they study with the greatest skill to represent sirens and satyrs by forms the most strange and extraordinary, cannot give them natures which are entirely new, but merely make a certain medley of the members of different animals; or if their imagination is extravagant enough to invent something so novel that nothing similar has ever before been seen, and that then their work represents a thing purely fictitious and absolutely false, it is certain all the same that the colours of which this is composed are necessarily real. And for the same reason, although these general things, [a body], eyes, a head, hands, and such like, may be imaginary, we are bound at the same time to confess that there are at least some other objects yet more simple and more universal, which are real and true.

Dreams and imaginary constructs are like painters that need to patch together existing animal body parts and colors. So much the worse for the alleged power of the mind to create content! The same point has been raised by many, notably Thomas Nagel (Nagel 1974, 439):

Yet, if I try to imagine this, I am restricted to the resources of my own mind, and those resources are inadequate to the task. I cannot perform it either by imagining additions to my present experience, or by imagining segments gradually subtracted from it, or by imagining some combination of additions, subtractions, and modifications.

Nagel is unaware that such boundaries of one's mind are, in reality, the boundaries of the physical world one's body interacts with. The difference between the bat's

experience and mine is identical with the difference between the bat's actual world and mine. The two actual worlds are largely disjointed sets of physical events. The impossibility of bridging the gap by sheer imagination does not only reveal a chasm between subjective enclaves, but rather the physical difference between two physical domains – in the bat's actual world there are sonar waves, in mine there are spectral reflectances. *Everything that human beings experience is a piece of their physical world.* Hallucinations and dreams are chimeric reshufflings of one's spread environment.

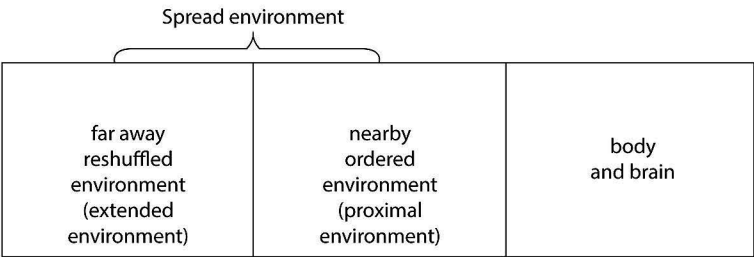
#### 7.4 Identity and hallucination

The proposed solution is that, in the case of one's experience, dreams and hallucinations are identical with external objects, albeit farther off and spatiotemporally scattered. How can it be possible? When one is awake, one's body is causally sensitive to the proximal surroundings, which are overwhelming with respect to more remote causal pathways. Because of various conditions, either external or internal, one's body gets shielded from the causal influence of the proximal environment. What goes on in the brain, though, is not random activity. It is the causal outcome of previous events that occurred previously outside the nervous system. That's the way brains are built. We are continuously entangled with everything that has happened since we were born. Usually, what happens in close spatiotemporal proximity takes over. But as soon as we put some barrier between us and our surroundings, the past, more or less remote, takes center stage. Our present is not a temporal bracketing but a causal manifold.

In fact, experiences that do not match our everyday notion of perception are the byproduct of mechanisms that shield the activity inside the brain from the causal influence of the proximal environment. In normal conditions, all our senses are open. Our primary cortical areas are causally coupled by the signals coming from the sensory organs. By and large, primary cortical areas are sensoritopic. They are almost a one-to-one mapping of the sensors. Whatever happens in the world is immediately mirrored by an effect inside the brain. The amount of causal coupling between world and brain is overwhelming. During wakefulness, the proximal world dominates the neural activity in large portions of the brain (Figure 13). Occasionally, something shelters the brain from such an overwhelming influx. It might be an environmental barrier, as when one lies in bed in a dark and silent room. It might be a physiological mechanism, as when one sleeps. It might be an experimental device, as in a sensory deprivation chamber. It might be a drug that inhibits certain brain areas, an impairment, or a trauma. In all such cases, something interferes with the causal influence that the proximal



environment exerts on current brain activity. As a result, older causal pathways take center stage and exert their causal influx.



**Figure 13.** Dreams, hallucinations, and perception

For instance, one week ago I met an old friend of mine in Harvard Square – Yuval Dolev. Since then my brain has been, so to speak, completely committed to proximal causes. Eventually, I went to bed and slept. While I was sleeping, both environmental and physiological factors were conjured up to shield my brain from nearby influences. Freed from more pressing causal processes, in my brain something happened, the cause of which was my chat with Yuval. This is the crucial step. What happened then in my brain was the effect of a remote cause, just as what happens in my brain when I perceive an apple is the effect of a nearby apple. Is it really so naïve to claim that something happened in my brain as an effect of a week-old occurrence? If it were naïve, or downright wrong, then it would also be a mistake to say that in my brain something happens as an effect of something that occurred 100 milliseconds ago. In fact, all arguments based on the time span between cause and effect would affect normal perception as well. If I rejected the possibility that Yuval produces an effect in my brain after one week, I should also reject the possibility that the red apple produces an effect in my brain after 100 milliseconds, as in the time-lag argument. If I applied such an argument, as mentioned before, I would end up admitting only the perception of the neural activity itself – an absurd conclusion.

Thus, if one perceives the apple, when one is no longer overwhelmed by current inputs, one will also perceive the one-week-ago-Yuval that is still producing effects in my brain. In fact, when I dream of Yuval, what is the only conceivable cause of my neural activity? Yuval, of course! In fact, if I had not met Yuval one week ago, I could not (and I would not) dream of him today.

From a practical perspective, it is useful that the brain is causally tuned to the proximal environment because that is the space-time region where most pressing matters occur. Sometimes it is a matter of life and death. Yet, sophisticated animals, like human beings, cope with longer timescales and indeed engage causally with

relatively remote events. When this longer causal engagement occurs, we call it memory, hallucinations, or dreams. Since the persistent perception of events may have practical shortcomings, a biological agent has further mechanisms that prevent it from happening all the time. In normal life, past perception must be inhibited.

By and large, then, hallucinations are the results of a double inhibition. During wakefulness, the relevance of the surroundings inhibits the past from being perceived – when some mechanism inhibits the inhibitions, the past can still exert its influence and one hallucinates or dreams.

The model suggests that, in normal conditions, *the surrounding environment shields us from the past* (Figure 14). When such a shield is lowered, the past flows and we can experience any combination of past events our bodies have had causal commerce with (Figure 15). We perceive them. There is a causal connection between earlier events and current neural events. This causal connection is just of the same nature as that that obtains when we perceive a nearby object. It spans a longer time and it is less obvious. Still a causal connection holds and we may conclude that it is just a case of perception. Thus, a hallucination is a perception of a spatiotemporally remote object or a collection of such objects either alone (as during dreams) or partially intermingled with everyday perception (as in classic wakeful hallucinations).

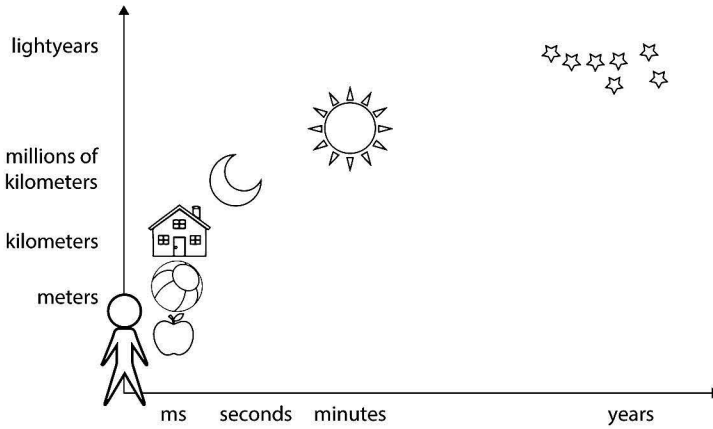
Moreover, in such conditions, the past is not constrained to exert its effects in the same order in which it occurred. Past events can intermingle and produce effects in novel combinations, and thus bring into existence a composed object one has never crossed paths with.

For instance, take the pink building I see now, the elephant I will see tomorrow at the zoo, and a flying bird I will see next week – all together, these objects will produce an effect in my brain one year from now, say 19 August 2017 at night. On that night, sleep will shield my body from the surroundings. As a result, those three events will join in their causal path and produce a joint effect. As usual, the joint effect will carve out a bizarre-yet-physical whole composed of three aspects: pink + flying + elephant = a pink flying elephant. I will dream of a pink flying elephant, and yet the pink flying elephant will be physical, like my son's face looking at me right now. Emilio's face is composed of two eyes, a nose, and a mouth. These are three separate objects that, because of my body in front of him, produce a joint effect and are brought into existence. The pink flying elephant is made of three separate objects that, because of my body in that future bed, will produce a joint effect and will thus be brought into existence.

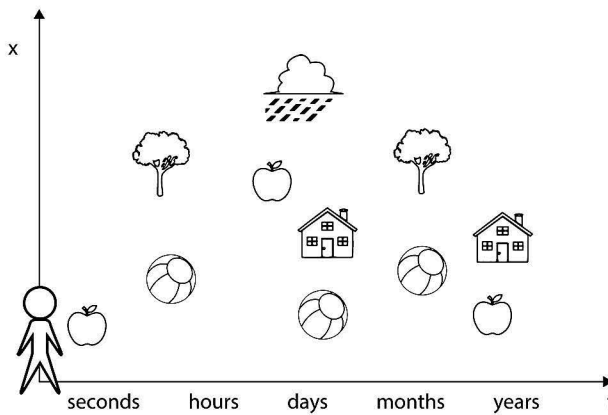
To recap, during wakefulness, a series of mechanisms guarantee that one's world is made of only the proximal objects. This is useful and efficient. Normally, one is coupled with the most pressing parts of one's environment. In various circumstances, though, one's world is made of combinations of objects picked up

from the whole causal story of one's body. Such combinations are just as real and physical as the more proximal objects. There is not a single reason why the latter should be any more substantial than the former. Thus, *hallucination is perception of causally reshuffled actual objects*. Hallucination is perception.

This model is amenable of empirical verification and it can be falsified. If it were possible that one dreamed or hallucinated something whose elementary constituents were not part of one's previous causal encounters in the world, the model would fail. So far, though, the empirical evidence points in the opposite direction – everything we experience has been part of the world we live in.



**Figure 14.** In everyday perception, the objects that are identical with my perception might be placed at any time and distance. Still, they are identical with one's experience



**Figure 15.** During sleep, one's body is shielded from proximal causes and thus more remote causes can still exert their influence. Thus, one dreams – i.e., one perceives – of more remote events in the causal history of one's body

### 7.5 The common-kind assumption turned upside down

The model presented here allows us to turn the common-kind assumption. For clarity, consider Fiona Macpherson's outline of it (Macpherson 2013, 10, *italics mine*):

Common-kind theorists hold that states of the *same mental type* can occur in perception and hallucination. More particularly, they hold that any experience that could be had when perceiving (accurately or illusorily) could be had when hallucinating. This is because any way that the brain is stimulated in a case of perception could be a way that it is stimulated when no perception occurs, thus re-creating *the same end state*, which they hold to be identical with one's perceptual experience.

First and foremost, note that this formulation entails BRAINBOUND, or your favorite version of mind-brain identity. Yet, let's skip such an issue for the time being. By and large, the common-kind assumption has been used to argue that perception is a kind of hallucination. In contrast, I argue that the common-kind assumption entails that hallucination is a kind of perception. In brief, the common-kind assumption can be conveniently split into two premises:

1. In hallucination, there is no real object.
2. Introspectively, hallucination and perception are the same.

Based on such premises, a spreading strategy is routinely developed. The spreading strategy aims to show that, since there is no difference between perception and hallucination and since there is no external object during hallucination, in perception, too, one experiences something that is not the external object and thus what one perceives cannot be the physical object. Apparently, the common-kind assumption delivers a mortal blow to any hope for realism. Realists, though, counterattack by rejecting the second premise – namely, they deny that there is a difference between perceiving a dagger and hallucinating a dagger. The two cases are indeed different but, due to some cognitive shortcomings, one cannot report the difference. From such a rebuttal, disjunctivism follows (Byrne and Logue 2009). Roughly, for a disjunctivist, the difference between hallucination and perception exists but one is not aware of it – one is delusional about the two experiences being the same. I believe that both sensists and realists have been too hasty in accepting both premises as they were conceptually self-evident. Both premises are of an empirical nature. They are not conceptual truths. They are empirical facts that have to be ascertained empirically. In contrast, I put forward a solution that saves both realism and introspection.

The strategy focuses on denying the first premise rather than the second. In fact, contrary to the standard view but consistently with empirical evidence, I have

so far shown that a physical object is always available. It is thus time to take advantage of such an option. If this claim has any merit, the first premise of the common-kind assumption will be false – *empirically* false – since in hallucination there will be a physical object as much as there is a physical object in everyday perception. I have argued at length as to how to locate such an object. Thus, the second premise will be true but it will mean the opposite of what dualists and sensationalists commonly think it does. There is no difference between hallucination and perception because they are both identical with an actual object. Hallucinations and perceptions are not the same because “the same end state” has been recreated but rather because the same object is one’s experience. What is the same is the external object rather than the neural activity/phenomenal experience/end state.

Consequently, the mind-object identity theory endorses realism and physicalism (in their strongest versions). In short, in contrast with disjunctivism, it is possible to keep the second premise of the common-kind assumption but reject the first – namely that, when one hallucinates, there is no external object. The theory shows how to locate a real physical object for all cases of experience – hallucinations, dreams, and so forth. Thus, realism is saved without having to deny the introspective similarity between perception and hallucination.

Indeed, in the presented account, there is no ontological difference between hallucinating a dagger and seeing a dagger – in both cases, there is a dagger and one’s experience is identical with it (Figure 12). There is a difference in terms of beliefs but not in terms of perception. In everyday perception, the dagger is a few meters and a few-hundred milliseconds away. In a hallucination, the dagger is many hours, days, or even years away. However, there is still a dagger. More precisely, there *was* a dagger. Yet, things are no so different because in everyday perception too there *was* a dagger. However, in everyday perception the dagger one sees is separated only by an imperceptible fraction of an instant. This is an important practical difference but not an ontological chasm. The direction of the spreading strategy, normally moving from hallucination to perception, is reversed. Now, the explanatory strategy goes from perception to hallucination (Table 3). However, perception has the leading role and hallucinations only have an ancillary role. Realism is safe!

Table 3. The explanatory direction of spreading strategies

|                          |                            |
|--------------------------|----------------------------|
| TRADITIONAL VIEWS:       | HALLUCINATION → PERCEPTION |
| THE VIEW PRESENTED HERE: | PERCEPTION → HALLUCINATION |

The conceptual effect of such an inversion – explaining hallucination in terms of perception rather than perception in terms of reliable hallucination – is paramount. Since Descartes, the subordination of perception to hallucination has hijacked most scientific and philosophical reflections. For centuries, scientists,

philosophers, and laypeople alike have believed in the difference between what the world is and how the world appears to be – between appearance and reality. The notion that we live in a kind of perennial dream or hallucination, which our senses and brains painstakingly keep in sync with the external world, is at the core of the Western view of nature and the world. The unsuspecting laymen believe their experience is a three-dimensional movie played inside their heads. This gloomy view is no longer necessary. Setting aside the argument from hallucination paves the way to eradicating all distinctions between experience and things, between appearance and reality, between mind and world.

Once the argument of hallucination is set aside, in fact, what evidence do we have that our experience is locally supervenient on or identical with brain activity? None, because, at some point in the spatiotemporal manifold, the external object is available. Furthermore, neural activity and internal causes are both non-specific and different from one's experience. Empirical evidence points in the opposite direction – no cases of world-unrelated hallucinations have ever occurred. The rebuttal of the first premise of the common kind assumption will allow to revise many popular account of perception. For instance, consider Mark Johnston's formulation of the causal theory of perception (Johnston 2004):

[...] whatever the hallucinatory state of the subject's brain might be, the subject can get into the relevant state in two different ways. In the standard case – the case of seeing – that state is the last effect of a causal chain beginning with light coming from the object, then continuing with the stimulation of the retina and the optic nerve, then involving the activation of the visual cortex. In the non-standard case – the case of hallucinating – the earlier parts of the causal chain involving the external object, light (and perhaps the optic nerve) are bypassed. The same kind of state of the visual system, indeed the same kind of total brain-state, can be produced either way. Now we have a crucial step. If in the case of hallucination such a total brain state is sufficient for the act of awareness involved in hallucination, how could it cease to be sufficient for that kind of act of awareness when the very same kind of total brain state is caused by a longer, more involved causal process, say the causal process characteristic of seeing? The act of awareness involved in hallucination has a certain character, and is an awareness of whatever object it is an awareness of, just thanks to the occurrence of that total brain state.

The text suggests that one's visual experience is either identical with or caused solely by the "state [that] is the last effect of a causal chain," and that "in the case of hallucination such a total brain state is sufficient for the act of awareness." These prejudices are engrained in the philosophical discussion but are neither conceptually necessary nor empirically sound. Worse still, they are bound together by a mutually circular endorsement. The brain state is taken to be sufficient since the argument from hallucination assumes there is no external object, and *vice versa*.

It is an example of the philosophical rat-pack I mentioned at the beginning of this book. Many people find the common-kind assumption compelling because they accept some version of the causal argument. The causal argument appeals to the idea that the character of hallucinatory experiences only supervenes on the state of the subject's brain – namely, it is the last step in the causal chain (Macpherson's "end state"). Yet, the connection between the origin and the last step of the causal chain is purely contingent. Thus, once the causal model has been accepted, the first premise of the argument from hallucination must hold. Crucially, scholars have found the causal model so feasible mostly because they have accepted the empirical soundness of the arguments from hallucination and the common-kind assumption. Rat-pack again!

The persuasive force of the question-begging tangle of the common-kind assumption, local supervenience, and the causal theory of perception has been formidable. Luckily, we can dismiss the whole rat-pack.

## 7.6 Illusions

I have left illusions until last because they can be accounted of in terms of wrong beliefs rather than wrong perceptions. In contrast, in the recent philosophical discussion, illusions are typically defined as cases in which one perceives some object in the world, but perceives it inaccurately in some respect – O looks like F, but O is not F. The object is there, yet it does not appear as we hold it ought to appear. You look at the two lines in the Müller-Lyer illusion and they appear to be of different lengths, but their length is the same. While illusions are not as dramatic as hallucinations, they seem to provide another formidable empirical case for a separation between what one experiences and the properties of external objects.

Yet, once more, the above traditional account is based on the assumption that we know what we perceive – i.e., the Galilean object whose properties are assumed to be known. The key to unlocking the traditional account of illusion is the presumption that one knows the property that one *ought to perceive*. This is wrong. In contrast, if one does not assume to know *a priori* what the physical property one perceives is, an alternative account will be available.

Consider the Müller-Lyer illusion. It is commonly assumed that objects have absolute length and that that is the property one perceives. In everyday life, the property one perceives and the absolute length match each other quite well. Yet, in the case of the Müller-Lyer illusion, they do not. Since they don't match, you assume that experience is to be blamed. Mental length is wrong! Thus, a widespread model of illusion is that one perceives a mental length that does not match the physical length. Such an explanation is surely popular, but it is based on two critical assumptions:

1. One experiences a mental property that should match against the physical property.
2. One knows *a priori* what is the physical property that one perceives.

I argue that both assumptions are flawed and that a much simpler explanation becomes available once they are set aside. The former assumption is question-begging, since the existence of mental properties should be proved rather than assumed. The latter assumption is flawed since, as I will argue right below, we do not know what we perceive exactly. The reasons why one perceives a property and one believes to perceive another are economical rather than conceptual – it is often difficult to directly measure a physical property, and it is much easier to perceive some other, more easily accessible, property.

Consider again the Müller-Lyer illusion. Due to the structure of their sensory apparatus, human beings lack the means to directly perceive the length of an object. Human eyes are not equipped with lasers. Human beings must cope with a rather deficient visual system (Hubel and Wiesel 2004; O'Regan 1992). However, through natural selection, they have acquired the capability to estimate length indirectly by means of perceiving other, more easily accessible, geometrical visual cues that, give or take, correlate reliably with length (not unlike when we estimate someone's age through various cues). The skill is very useful and thus humans use such an approximate property to estimate length. Crucially, such a skill does not pick up length, but another property that is a complex cluster of geometrical properties such as converging lines, convex angles, pattern similarity, shadows, relative angles, relative size, and so forth. Call such an approximate but optically available property the *proxy property*. Call the absolute physical length the *alleged property*. In everyday life, the proxy property, which is easier to perceive, and the alleged property match reliably. In unusual cases, though, such as the Müller-Lyer illusion, the *proxy* length is different from the *alleged* length. As a result, one perceives the two lines as having different lengths. Yet, the two lines do not have different *alleged* lengths: they have different *proxy* lengths. Yet, both proxy and alleged lengths are external physical properties. There is no need to appeal to any mental length. Neither is there any misperception or misexperience, only misbeliefs. The experience is correct. It is the belief about what one perceives that it is mistaken. We believed to know what we perceived when we perceived length. We were mistaken. One of the Müller-Lyer lines has a greater proxy length than the other. Thus one perceives a different proxy length. Perception is always right. The physical property one perceives is different in the two lines, only it is not the absolute length that is usually assumed to be.

In brief,  $F^*$  the proxy property,  $F$  is the alleged property.  $O$  is  $F^*$  but one believes  $O$  ought to be  $F$ . Consequently, one perceive  $O$  as  $F^*$  but one sticks to the



belief that O ought to be F. Thus, one takes F\* to be an illusion and draws the conclusion that O looks like F\* but O is F. The solution is that O is not F, O is F\* and, coherently, O looks like F\*!

Müller-Lyer lines appear to be of different lengths because they have different proxy lengths. *They look different because they are different.* In illusions, no perceptual error occurs – the mistake is a matter of misbelief. One believes to perceive the absolute length of an object, while one actually perceives something else that usually matches the absolute length. Though, it does not. The property that one perceives (the proxy property) is different from the property that one believes one ought to perceive (the alleged property). The property that one perceives is the property that is physically there. This shift in perspective allows us to reformulate all cases of illusions as cases of misbelief about what one perceives.

For instance, consider the traditional illusion of mirages, where one sees water where there is no water, as in the desert. Yet, by means of vision we have no way to know whether a substance is made of water. Thus, what do humans do? They perceive another proxy property – in this case, a horizontal mirror-like light reflectance. Such a property, in a natural environment, is often instantiated by pools of water. Thus, we get used to believing that horizontal mirror-like light reflectance is what looks like – it is being made of water. Being made of water is the property we are interested in, because we need water to survive, but mirror-like reflectance is good enough. However, sometimes, unusual circumstances occur and thus we are puzzled. Our entrenched beliefs are put to test. Being made of water is the *alleged* property, while mirror-like reflectance is the *proxy* property. By the same token, a Fremmen from Arrakis would have the opposite illusion because he would have the opposite belief as to what the property ought to be!

Due to space limitations, I cannot even begin to address all cases of illusion, such as Benham disks, Lilac, Evian, Ponzo, Ebbinghaus, and so forth. However, I hope that readers will consider trying to apply the *proxy/alleged* distinction to their favorite illusion.

As yet another example, consider weight and mass. Human beings estimate mass by means of weight. On the Earth, people grab something and perceive the strength that the object exerts on their arm. However, an astronaut on the Moon feels a much weaker force. The lunar gravity's pull is much weaker than the Earth's and thus the weight of each object is greatly diminished (roughly one sixth of the weight on the Earth). However, mass is, always the same. Thus, an astronaut feels as though objects weigh less. If one applied the same logic used in cases of illusion, one ought to conclude that the astronaut has the illusion that objects have less mass on the Moon than on the Earth. Yet, nobody has felt the need to explain what happens to astronauts in terms of illusory perception – it would be pointless to claim that the astronaut has the illusion that objects' masses are diminished. In fact, human beings are interested in the mass of objects. For instance, one may

weigh a bag to know how many apples are inside, a flask to know how much water is still inside, or a medallion to know how much gold is in it. Since we know the property that is perceived to estimate mass – i.e., weight – it is obvious that such a property is smaller on the Moon than on the Earth. However, weight is neither an illusory mass nor a mental mass. Weight is just the physical property that Earthlings use to conveniently estimate mass. Using the suggested terminology, weight is the *proxy* property, while mass is the *alleged* property.

Compare this account of illusions to Billy Brewer's account of illusions. To a certain extent, the two accounts overlap. According to Brewer, illusions result from perceiving something that is common between standard perception and illusion (*italics mine*, Brewer 2009, 173):

[...] two objects have visually relevant similarities when they share sufficiently many common properties amongst those, which evidently have a significant involvement in the external physical processes underlying vision. Thus, and very crudely, *visually relevant similarities are identities in such things* as, the way in which light is reflected and transmitted from the objects in question, and the way in which stimuli are handled by the visual system, given its evolutionary history and our shared training during development.

Brewer's account of illusions and mine have commonalities. Brewer's notion of visually relevant similarities is akin to the notion of proxy properties. "Such things" are those things that compose the proxy property that one experiences. Like Brewer, I consider a veridical account of illusions to be paramount.

Illusions cannot be false perception if perception is a way to be in contact with the real world. Illusions can cause false beliefs, though. I have false beliefs about what I perceive: "The error in illusory cases lies in the fact that such objects have the power to mislead us, in virtue of their perceptually relevant similarities with other things" (Brewer 2006a, 168). About the Müller-Lyer diagram, Brewer notes that "the hashes at the ends of the lines have the power to mislead her as to their relative lengths" (Brewer 2006a, 169). Illusion is perception that leads to wrong beliefs about what is seen. I agree with a proviso. As I tried to make clear in the above, *the wrong belief is about what one perceives normally* rather than about what one perceives in the illusory case. One believes one ought to perceive the length of lines (the alleged property), while one perceives another geometric property (the proxy property). In the Müller-Lyer diagram, the two properties do not co-occur. That is a key difference between the two accounts.

The conceptual shift of the mind-object identity theory allows us to avoid any mental or illusory additional properties – it allows us to deal only with physical properties. Everything we perceive is a physical property in the external world. Illusions are not misperceptions, but erroneous beliefs about the nature of the physical properties one experiences in everyday perception.



## CHAPTER 8

# Neuroscientific evidence

*As if the objects themselves were present.*

(Charles Bonnet)

It might appear incongruous to seek neuroscientific evidence for a mind-object identity theory that dismisses the brain aside as the physical basis of consciousness. Yet, such a move is not so bizarre for a series of reasons. The first is that the hypothesis I put forward in this book is an empirical hypothesis that, at the end of the day, will have to be proven or disproven on the basis of empirical evidence. Second, neuroscientific evidence might either disprove or provide support for the proposed theory. For instance, if there were any evidence of purely endogenous mental content, the proposed theory would fail. If one could show that a piece of neural tissue in vitro concocts phenomenal experience, this would be a mortal blow. Is there any such evidence? I will claim that there isn't. Third, neuroscience is ideally placed to disprove or to provide support for my proposal. The fact that, so far, neuroscience has not done anything like that – i.e., no psycho-neural laws have been proposed, no evidence of subjective evidence at the level of neural activity has been presented, and so forth – is indirect proof that consciousness must lie elsewhere. Finally, neuroscience has collected an impressive amount of data about the physical system that is responsible for the occurrence of the external objects that I suggest are one's experience. Thus, it is paramount to see whether the proposed theory matches such findings.

To recap, a convincing – albeit indirect – piece of evidence for the mind-object identity theory is the persistent failure of neuroscience to find anything like experience amidst neurons. Another indirect piece of evidence is the lack of evidence about phenomenal experiences whose origins are not traceable to the external world. In other words, all our experiences – be they a perception or a dream or a hallucination – are made of stuff we encounter in the external world. We do not see or hallucinate colors we have not encountered in the real world. We do not imagine a hue of blue we have never actually seen. We do not hallucinate or dream of anything that has not been part of the world we have lived in. *We do not experience anything but the physical world in various combinations.* We call the most useful combinations perceptions, and the others get fancy names,

such as dreams, hallucinations, and so forth. Is it so difficult to consider that our experience is the external world?

The question as to whether a subject can concoct a novel experience out of sheer mental power has been posed by many. And neuroscience and psychology have, so far, only provided negative evidence. Notwithstanding the fact they moved from the opposite notion, one cannot 'raise up to himself' any idea that does not follow from actual contact between one's body and the corresponding physical phenomenon. Empirical findings show consistently that subjects do not imagine any phenomenal qualities that are not the outcome of actual sensor modalities. Congenitally deprived subjects lack the corresponding collection of basic experiences – e.g., congenitally blind subjects have no experience of colors.

The above statements might surprise many readers that have grown accustomed to the notion that in the inner world of the mind anything goes – e.g., can't a congenitally blind man dream of a wonderful world full of colors and marvelous landscapes? Unfortunately, this is not the case. This chapter is devoted to showing that, to the best of our knowledge – apart from a handful of dubious and extremely rare cases – the available empirical evidence shows that we are restricted to dreaming, imagining, and hallucinating the world we live in albeit reshuffled. As the proposed approach predicts, perception is identical with the proximal surrounding world, while dreams and hallucinations are identical with reshuffled combinations. No purely mental content has ever been reported.

Many neuroscientists will object that the lack of novel phenomenal experience results from the lack of development of the proper internal structures. This, in turn, requires a healthy and prolonged interaction with the environment. Yet, this objection would be convincing if we aimed at a full-fledged and functionally coherent phenomenal experience. Yet, if the brain were really the forge where experience is created, small deviations and occasional mistakes should be expected. Given all that can go wrong (and often does) in terms of drugs, chemicals, diseases, traumas, neoplastic growth, epileptic seizures, TMS, and direct brain stimulation of various sorts, occasionally unwanted and unexpected phenomenal qualities should pop up in one's experience. For instance, why do incongruous color hues not appear now and then? Of course, these unexpected apparitions are not to be expected in standard circumstances and healthy subjects, but *what should prevent an anomalous brain from producing anomalous mental content, if the brain were the forge of the mind?* As I have argued before, hallucinations and dreams are *chimeric* – they create new objects by combining elements one has perceived before. *The brain does not secrete any mental juice.*

A recurrent myth is that, by means of direct brain stimulation, a subject can experience all kinds of content. This is not the case. In fact, if one checks the literature, one will find that direct brain stimulation is only able to rehearse old episodes

or combinations of them. So far, there is no evidence that one can have an alien phenomenal experience by means of direct brain stimulation.

The goal of this chapter is to show that none of the available neuroscientific evidence shows any real autonomy of the mental over the physical. The chapter will focus on a series of well-known cases that are often quoted to support some version of the local supervenience of the mind on the brain – i.e., that consciousness takes place inside the brain. Such evidence, I try to show, has been hugely overestimated. Of course, I do not claim this account to be exhaustive. A whole book might be filled with examples of the difference between what neural evidence actually shows and what neural evidence claims to show. The following is only a selection of a few, but – I hope – significant, cases.

A final caveat – the strongest evidence for the mind-object identity theory is, of course, just our plain, familiar everyday perception. Every time we open our eyes we experience the object we have in front of us, even if our body is made of grey cells and blood vessels that do not share anything with the external object and our experience of it. This is the strongest evidence for my proposal and its familiarity should not diminish its importance.

## 8.1 Penfield and direct brain stimulation

There is probably no more widely quoted experimental study than Penfield's direct stimulation of the brain (Penfield 1950; Penfield 1972). Because of his findings, the notion that the brain is a sort of universal generator of phenomenal experience gained incredible momentum in popular culture. Since then, the idea that, as long as technology improves enough, the brain has the power to generate any kind of phenomenal experience has become commonplace in sci-fi movies. Yet, this interpretation is not supported by Penfield's actual empirical evidence.

As a matter of fact, if one peruses the hundreds of reports collected by Penfield, one will not find a single case of a genuinely new phenomenal experience. Penfield's subjects reported reliving past episodes or combinations of them. They reported hallucinating friends, relatives, familiar or unfamiliar places, anonymous people, voices, music they had heard before, and so forth. Yet, everything they claimed to experience was composed of fragments of their own world. Their brains never produced any new stuff because of the direct electrical stimulation. They recombined their worlds, but did not concoct new ones. To convince yourself, consider a few of his subjects' reports (Penfield and Perot 1963, 614–32):

“Like company in the room. [...] it was like being in a dance hall, like standing in the doorway in a gymnasium like at the Kenwood High school. [...] People's voices.” When asked, he said. “Relatives, my mother [...] It seemed as if my niece

and nephew were visiting at my home. [...] They were getting ready to go home, putting their things on their coats and hats." When asked where, he said, "In the dining room – the front room – they were moving about. There were three of them and my mother was talking to them. She was rushed – in a hurry. I could not see them clearly or hear them clearly. (Subject #1, R. B.)

"I hear music now – a funny little piece." Stimulation was continued. Patient became more talkative than usual, explaining the music was something she had heard on the radio – it was the theme of a children's program. When asked, she said it was a record. (Subject #6, M. G.)

A voice saying, "Jimmy. Jimmy, Jimmy." When asked, she said it was her husband's name and what she calls him. (Subject #8, R. L.)

The surgeon said, "See if it comes again." Immediately upon application of the electrode, he said, "Yes, get out." it was a man's voice in a pool room, telling A.P. to get out. When asked, he said, "I have been in a pool room before; it might be that same one or it might not." Six weeks after the operation, in the clinic. A.P. was asked about this. He said that he remembered the incident clearly: it had happened about three years previously. He got angry after missing a shot at the pool table and broke his cue. The manager attempted to throw him out and a fight ensued. This incident made quite an impression on him. (Subject #13, A. P.)

All such reports have one thing in common. Penfield's patients hallucinated only things that had been part of their lives. Thus, the evidence shows that the brain cannot create new or even alien phenomenal experiences – rather, the stimulation allows past episodes to be perceived in unusual combinations.

Consistently, less invasive modern techniques for direct brain stimulation, such as transcranial magnetic stimulation (TMS), do not elicit hallucinations of anything that had not been part of one's life (Rao et al. 2007; Casali et al. 2010; Salminen-Vaparanta et al. 2013; Kanai, Paulus, and Walsh 2010; Ptito et al. 2008; Kammer et al. 2005; Lamme 2006). Subjects experience moments of their past lives, albeit bizarrely reshuffled, but no new content is created.

These findings are significant and, once more, provide support for the mind-object identity theory (or, at least, do not refute it). In fact, one might wonder why such unusual stimulations (either electric potential applied directly to the cortex or very intense magnetic fields) should not occasionally propel one's experience completely out of everyday experiential domain. Why should a subject not perceive a new color or a completely unexpected phenomenal experience? Why is the brain so resilient to such an artificially induced, unusual condition? The utter lack of novel content confirms the predicted chimeric nature of hallucinations and is yet another confirmation of the identity between experience and the external world.

## 8.2 Congenitally blind subjects and visual experience

Another traditional source of evidence is provided by blind subjects. The fact that they are capable of dreaming and hallucinating colors is cited as proof that phenomenal experience is created inside the brain. Yet, once again, this is not the case. Visual dreams would count as evidence against the mind-object identity theory only if the blind hallucinators were congenitally blind. In fact, given the notion of an actual environment, one's world is not limited to the proximal surroundings but extends to one's whole life. Thus, if one gets blind at any age, one's brain is still the causal outcome of earlier visual events. Thus, as one hallucinates a deceased relative by remaining causally entangled with some previous episode, so a late blind hallucinator may well experience colors one had previously been in contact with. In the literature about blindness, the two most common examples of visual features are colors and perspectival imaging.

The key point of contention is not whether blind subjects dream or hallucinate visual features, but rather whether *congenitally totally* blind subjects do. The latter is a much less common case and there is no clear evidence that congenitally totally blind subjects have ever dreamed or hallucinated any color. In fact, the evidence about what congenitally completely blind subjects do is often inferred on the basis of what late blind subjects do. Of course, this is not convincing since inferences are biased by the very model evidence should back up.

In many reports, subjects are often labeled blind but it is unclear whether they are really totally congenitally blind or just early blind. Moreover, the attribute of *totally blind* is sometimes used with a certain degree of latitude. For instance, a well-known subject, a blind girl called Gaia, was described as totally blind and yet her "vision at best was peripheral" (Kennedy 2003). Either Gaia was *totally blind* or Gaia *had some vision* (no matter how peripheral or diminished).

Moreover, congenitally impaired subjects live in a social environment and it is only natural that they feel some pressure from their peers and relatives to develop what looks like a marvelous gift. In the case of Gaia, her mother "*steadily encouraged her*" (Kennedy 2003). This is not to say that such subjects lie, just that their claims should be scrutinized as much as other similarly extraordinary claims are scrutinized in other fields (for instance, parapsychology). It would not be the first time that subjects were unaware of exploiting covert or unconscious hints that allowed them to perform in an apparently astounding way. In fact, I do not see much of a difference between parapsychological claims and the alleged capability of a congenitally blind person to access the world of colors and other purely visual features. Both feats, if real, appear to contradict our understanding of the physical world.

Thus, what does the evidence really say? Let's consider color first. Do congenitally blind subjects ever dream of color? Most of the evidence points to the opposite



direction (R. H. Wheeler 1918; Hurovitz et al. 1999; Kerr and Domhoff 2004). One of the very few reported case of congenitally blind subjects that claimed to have mental imagery of colored patches is a Turkish painter, Esref Armagan, who has made a living out of such claims (Kennedy and Juricevic 2006; Amedi et al. 2008). It is fair to have some suspicion about such claims. In fact, no explanation has ever been provided as to how Armagan may address colors. Yet, Amedi et al. referred to the fact that the blind subject used “rich and vibrant” colors. This is clearly misleading, since it suggests that the colors are somehow part of Armagan’s visual experience. This is not the case. Clearly, apart from supernatural knowledge, Armagan depends on sighted people around him to pick those colors, discriminate between them, and attribute to them the right meaning. If a mischievous experimenter gave Armagan only black pigments and told him deceptively that such pigments were colored, Armagan would have no way of sensing the deceit. His work would then result in an indistinct black surface. Nothing short of a miracle would allow him to do otherwise.

The fact that Armagan might have developed the conceptual capacity to manipulate colors is not proof that he experiences them. He might be more akin to a skilled mathematician who developed the capability to handle awkward conceptual spaces.

A possible objection is that blind subjects would not know whether they experience colors. In fact, they could not point to a colored object, since their colors would be purely mental. They would not see colored objects in their surroundings. Thus such subjects could not point out to the property that standard subjects refer to as color. Congenitally blind subjects might experience colors and not report them. Yet, they might report that they experience something alien to the properties they experience by means of their sensors – touch, hearing, taste, smell. To the best of our knowledge, they do not report any alien phenomenal experience. Similarly, we do not.

What about perspectival imaging? As a matter of fact, the capability (either innate or acquired) of mastering three-dimensional objects, descriptions and drawing techniques may have a completely different explanation. Blind subjects live in a three-dimensional world and tackle spatial features by means of other senses. This means that their body is actually in contact with three-dimensional properties. They can access shape, space, and distance through touch, hearing, and other subtle cues in all other senses. With the exception of colors, then, spatial competence and experience do not challenge the mind-object identity theory – on the contrary, they confirm it. Both space and shape are supermodal phenomena in the sense that they can be accessed through multiple sensor modality.

In this regard, Kennedy wrote that “the blind do have untapped abilities to use depiction; picturing is perceptual not just visual” (Kennedy 1980, 13). Likewise,

Dominic McIver Lopes observed that the fact that a blind person may experience “tactile pictures” akin to “visual pictures” (Lopes 2002; Lopes 1996; Lopes 1997) suggests that features like shape or spatial relations are not purely visual, but supramodal (Kupers et al. 2011; Pietrini et al. 2004). They are objects that can be accessed by means of different senses.

In fact, drawing techniques, like perspective, are essentially geometrical constructions. They can be envisaged and, indeed, mastered without any reference to visual processes. The fact that our eye is, to some extent, isomorphic with such a technique does not entail that vision is equivalent to a projective tool (*pace* Leonardo da Vinci and Giovanni Battista Della Porta). Likewise, if a visually impaired subject learns to master this geometric rule, it does not mean that she has acquired an inner eye. It only means that she is skilled in projecting three-dimensional objects onto planes.

The problem-solving nature of drawing skills in blind subjects is manifest in many blind subjects’ reports. For instance (Kennedy 1993, 108):

Ray said, ‘If you’re looking straight down, you’d draw a rectangle without legs, because you won’t see them.’ He proceeded to draw a rectangle. Next, he said, ‘If you drew it directly from the side, you’d only see two legs – a rectangle with two legs.’ He then drew a rectangle with two straight appendages coming down the page. His third drawing was ingenious. He drew a rectangle with four appendages, each one radiating from a corner of the rectangle. He said, ‘But to do it this way, you’d have to be under the table.’

This is an example of problem solving akin to someone exploring an unusual and unknown conceptual space. Ray accesses a spatial domain by means of touch and develops a perspectival geometrical tool that would allow him to squeeze three-dimensional objects he is acquainted with into a two-dimensional structure.

As to how blind subjects obtain their perspectival skills, there is evidence that they do so thanks to the intervention and guidance of sighted peers, notwithstanding claims to the contrary. Consider this description of how a blind subject came to appreciate perspective (Lopes 2002):

Were a blind man standing at the Place de la Concorde asked to trace with his hands each side of the Champs Élysées to the Arc de Triomphe, he would start with arms stretched apart and then gradually bring them together until they met. His arms would converge as they point to more distant objects.

How could his arm converge if they were not guided by a sighted helper? Of course such learning method works in the case of smaller objects such as household furniture, tables and chair, for which the blind may form a first-hand spatial experience. Rather than through vision or touch, subjects get supramodal aspects that are neither visual nor tactile. In this case, they are spatial and geometrical.

By the same token, it is possible to envisage other kinds of supramodal content that are shared by separate sensor modalities – e.g., sequence, rhythm, patterns, syntactical structures, combinatorial rules, and so forth. In fact, Hopkins argued against the similarity between visual experiences by means of “tactile pictures” and actual visual experiences on the ground that tactile pictures are not pictures (Hopkins 2000, 165):

In the case of tactile pictures, it seems that, at least very often, there will be no properties common to the picture, as we feel it to be, and the object, as we would feel that to be. The outline shape might be shared by picture and object, but it is not represented in our experience of either. And likewise for contour.

In conclusion, the evidence about visual mental imagery in congenitally blind subjects is scanty at best. There is no convincing evidence about purely visual features such as colors. Other traditional examples of visual imagery, such as perspective, can be explained in a much more parsimonious way as cases of either innate or acquired skills. Skills are not experience.

### 8.3 Hallucinations caused by sensory blockage

In previous chapters, I outlined the double inhibition account of hallucinations. The hypothesis suggests that everyday sensory input inhibits any other causal pathways by means of its sheer overwhelming causal strength. Thus, in standard everyday conditions, our experience is identical only with what happens next to one's body. However, if such an invasive-yet-useful source of causal coupling is hampered, hallucinations or dreams will ensue. This is another prediction of the presented theory.

We have all experienced the familiar phenomenon of daydreaming. When we listen to a super boring lecture on a dozy afternoon, there is a threshold of boredom after which we cannot prevent images and thoughts from literally parading in front of us. All kinds of things appear. While such a state is not yet so powerful as to be accounted for in terms of hallucination, it is very close to it. We have the distinct feeling that a larger world is finding its way in, no longer hampered by the value of what is happening in proximity to our body.

Sleep is an even more straightforward case. The causal significance of the environment is diminished – shutting the shades, it being night-time, switching off lights – and our body enters into a physiological state that reduces the intensity of incoming signals. We then start to dream, and nobody knows why! Well, we know a lot about why we sleep and what the brain does during sleep (Horowitz et al. 2009; Stickgold 2005; Stickgold and Walker 2005; Wagner et al. 2004; Mahowald 1997;

A. J. Hobson 2002; J. M. Siegel 2009; Maquet 2001; J. M. Siegel 2008; Diekelmann and Born 2010; Llewellyn 2013). Yet, we do not know why such a useful maintenance activity requires dreams. Why could sleep not be a purely restive state, devoid of any experience? Why does brain maintenance require experience? After all, there seem to be mechanisms that prevent dreams from being remembered, thus their value as conscious experiences is not that obvious. To the best of our knowledge, all the supposed benefits of the neural activity underpinning dreams – learning, consolidation, pruning, and simulation – may be gained without the associated conscious experience. According to the presented theory, the reason why we dream is that our body gets into a state of relative isolation from our proximal surroundings and thus its activity is the causal outcome of spatiotemporally further-off events, which are the stuff dreams are made of. *We dream because we cannot help but be something*, and if we are not the proximal environment, we are then a larger world, in whatever combinations such a world happens to occur.

Thus, cases of sleeping, dreaming, and daydreaming comply with the mind-object identity theory. Hampering the proximal causal coupling results in giving center stage to a larger collections of events scattered along one's body's causal history, which still affect one's brain. Does the same happen if other factors – either physiological or artificial – tinker with one's brain activities and cause a blockage of the nearby causal influences? Surprisingly, yes! There is strong evidence in favor of this. The surest method for producing hallucination appears to be a blockage of sensory input. Let's consider a few cases.

The first example is artificially induced sensory deprivation. This is obtained by perfecting what people do by going to sleep in a quiet and dark place on bumpless mattresses and silk linen. In fact, sensory deprivation determines various forms of hallucination by greatly diminishing the influence of proximal events (Gaines and Vetter 1968; Zubek 1969).

It is well known that a similar phenomenon happens to serious meditators. The process of inducing a sort of voluntary isolation from the environment triggers the experience of fleeting objects, features, faces, and episodes, not unlike hypnagogic and hypnopompic imagery.

Even more impressive cases are the hallucinations ensuing the disruption of a whole cortical input area (Hedges 2007; Ffytche 2005; Gold and Rabins 1989; Ffytche et al. 1998). This is usually referred to as Charles Bonnet syndrome because of the 18th-century physiologist, Charles Bonnet, who described the symptoms suffered by in his 87-year-old grandfather, Charles Lullin. Bonnett tells us that (*italics mine*, quoted and translated in Hedges 2007, 112–13):

I know a respectable man full of health, of ingenuousness, judgement, and memory, who, completely alert and independently from all outside influences,

sees from time to time, in front of him, figures of men, of women, of birds, of carriages, of buildings [...] etc. He sees these figures make various movements: getting closer, going away, fleeing, diminishing or increasing in size, appearing or disappearing; he sees the buildings rise in front of his eyes and a display of all the outside construction material. The tapestries in his apartment appear to change suddenly; these tapestries cover themselves with painting displaying different landscapes. Another day, instead of the tapestries and furniture it is only the naked walls with an assembly of raw materials. All these visions appear to him in perfect clarity and affect him as strongly *as if the objects themselves were present*. However, these are only paintings because the men and women do not talk and no noise comes to his ear.

As regards the nature of experience, the key point is that the subject perceived all these wondrous things “as if the objects themselves were present.” I cannot imagine a more fitting description for hallucination than his formulation. *Hallucinations occur as if the objects themselves were present*. In the mind-object identity theory, such a presence is a necessary and straightforward consequence of the fact that objects are indeed present!

The traditional explanation of Charles Bonnet syndrome is, of course, different. Since hallucinations are taken to be internal mental images, neuroscientists have gone to great lengths to explain some internal mechanism that generates images. Yet, they are puzzled by a curious fact: very similar symptoms and hallucinations are the outcome of two distinct kinds of damage. In fact, both in the case of damage to the periphery – e.g., to the retina or the optical nerve – and in the case of damage to the sensory cortical areas, Charles Bonnet syndrome occurs. The neurologist Dominich Ffytche distinguished the two cases: the former is Charles Bonnet syndrome 1 – i.e., visual hallucinations in the cognitively intact elderly – and the latter is Charles Bonnet syndrome 2 – e.g., visual hallucinations in eye disease. Ffytche admits that the similarity between the two conditions is rather puzzling since, from a neurological perspective, they are the outcomes of two very different kinds of impairment. In contrast, according to the mind-object identity theory, such a similarity is an easy prediction. No matter where the blockage occurs, once an area of the brain (if not the whole brain, as in sensory deprivation or dreaming) is shielded from the proximal surrounding, past events that remain causally efficacious are the objects identical with one’s experience. Thus, according to this hypothesis, it is only natural that the two forms of Charles Bonnet syndrome show similar symptoms.

Another interesting prediction is that Charles Bonnet hallucinations are related only to the sensory area that is subject to the blockage. Thus, in the case of Charles Bonnet’s grandfather, they were exclusively visual. This is a crucial factor. In fact, if they were the result of some internal generation of mental experience,

*why should they be constrained to the impaired modality only?* While one may envisage further mechanisms to achieve such an end, the proposed identity theory gives a much simpler solution: blocking a sensor modality hampers only certain causal pathways. All the others remain causally coupled with the proximal surroundings.

Not unlike Charles Bonnett syndrome is the popular case of the phantom limb (McGeoch and Ramachandran 2012; Goller et al. 2013; Brugger 2008; Wade 2009; Melzack 1992; Ramachandran and Rogers-Ramachandran 2000; Ramachandran 1998; Scatena 1990): patients with this syndrome experience an amputated limb as though it were still present. Once again, the key point is that subjects experience something “as still present”. Once the notion of “present” is revised, the theory predicts that amputee patients ought to experience a limb as though it were still present because, in a causal sense, it is still present. Where? The limb was attached to one’s body at the time when it was not yet amputated. But is this not a contradiction? The arm is no longer there. Yes, but there are two actual objects – one actual object is the arm at the time when the limb was still connected and another actual object is the arm after the amputation. Because of the deafferentiation resulting from the amputation, the former is still the cause of effects because the latter is no longer dominating the causal entanglement of brain and world. As in Valberg’s puzzle, one’s past can’t be severed. In the mind-object identity framework, all objects occur before their effects. Thus, the amputated limb is not that different from the arm still attached to the body. They are both actual objects taking place sometime before. The time span is larger for the amputated limb and shorter for the connected limb, but there is a time span in both cases.

A possible counterexample to such a realist interpretation of phantom limbs is the case of the innate phantom limb in congenitally limbless patients (Melzack et al. 1997; Saadah and Melzack 1994; Lacroix et al. 1992; Melzack 2001; Brugger et al. 2000; Ramachandran and McGeoch 2008). According to Saadah and Melzack (*italics mine*, 1994, 484), “*the brain generates the experience of the body*. Sensory inputs merely modulate that experience; they do not directly cause it.” The key claim here is that the body image is not identical with the brain but generated by unknown innate neural structures inside the brain. Such a position entails a strong commitment to dualism and should be flanked by an explanation as to what body images are if they are neither the brain nor the body. In my opinion, the case might be solved by distinguishing the body image from the body schema. The first is a set of phenomenal experiences that are expected to concoct the experience of a limb. The latter is any hardwired structure that supports the development of sensorimotor mapping. I suspect that innate phantom limbs in congenitally limbless patients are a case of innate body schema rather than of innate phenomenal experiences mysteriously stored in one’s genetic code. Moreover, it would be highly surprising if our body had stored an innate body image that would be superfluous

if one had a standard body (because the body can then be the source of the image) and useless if one was congenitally limbless.

Having a phantom limb is akin to both sensory deprivation and Charles Bonnett syndrome – they are all cases in which the current stimulus is absent due to a blockage (sensory deprivation), a damage in the causal path (Charles Bonnett syndrome), or the removal of the external object (phantom limb).

#### 8.4 Persisting objects

Another case of unusual actual objects is offered by the persistence of an object due to the sudden destruction of the causal path. Thus the last cause persists. This is indeed similar to the phantom limb. However, other interesting cases are available. One is offered by a condition suffered by Oliver Sack in his last years: a rare tumor that destroyed his right fovea (the central region of the retina). As a result, Sacks suffered from a bizarre condition that puzzled him and that I quote at length because it is an almost perfect case of mind-object identity where the proximal causal entanglement is lost (*italics mine*, Sacks 2011, Kindle 2045–2050):

If I have been looking at something and then close my eyes, I continue to see it so clearly that I wonder whether I have actually closed my eyes. A startling example of this happened a few minutes ago when I was in the bathroom. I had washed my hands, was staring at the washbasin, and then, for some reason, closed my left eye. I still saw the washbasin, large as life. I went back into my room, thinking that the dressing over the right eye must be absolutely transparent! This was my first thought and, as I realized a moment later, an absurd one. The dressing was anything but transparent – it was a great wodge of plastic, metal, and gauze half an inch thick. And my eye, beneath it, still had one of its muscles detached and was in no position to see anything. For the fifteen seconds or so that I had kept my good eye closed, I could not have been seeing anything at all. Yet I did see the washbasin – clear, bright, and real as could be. For some reason, *the image on my retina, or in my brain, was not being erased in the normal way*. [...] I continued to see the washbasin, the commode next to it, the mirror above it, the entire scene for a good fifteen seconds – a genuine *persistence* of vision.

Later, he reports that ...

At one point, after gazing at the bookshelves in my bedroom for a few minutes, I closed both eyes and saw, for ten or fifteen seconds, the hundreds of books arrayed on the shelves in great, almost perceptual detail. This was not filling in but something quite different – a persistence of vision similar to what I had experienced in the hospital eighteen months earlier, when I seemed to see the washbasin so clearly “through” my eye patch. I have difficulty evoking a mental

picture of a friend's face, or my living room, or anything at all. The persistence of vision I had experienced was richly, mindlessly detailed, much more so than any voluntary image. It was so detailed I could see the colors of cars and sometimes read their license plates, to which I had paid no conscious attention. Involuntary, unselective, unstoppable, *the image seemed to me akin to photographic or eidetic imagery – but, unlike eidetic imagery, it had a very definite and brief duration, lasting ten or fifteen seconds and then fading.* At one point, as I was walking with a friend, I saw two men walking towards us, both wearing white shirts, brilliantly clear in the late-afternoon sun. I stopped and closed my eyes, and found that I could continue to watch them, seemingly still walking towards us. When I opened my eyes, I was startled to find that the men in white shirts were nowhere to be seen. They had, of course, walked past us, but I was so engrossed in what I “saw” with my eyes closed – an arrested fragment of the past – that I got a sudden shock of discontinuity. I say “arrested,” but what I saw in *my mind's eye* had motion, too. The men were walking, striding, yet they remained in the center of my mind's eye as they walked, without getting anywhere, as if on a treadmill. *I had captured this bit of motion, like a film loop, which recycled in my mind even after they had gone.* (Kindle Locations 2267–2268)

His text (which I took the liberty to quote at length) describes perfectly the persistence of reality when the continuous update from the environment is suspended. He describes his condition as a “persistence of vision” – i.e., seeing something in the impaired part of the retina, something he saw sometime before. His account is remarkable for a series of reasons:

- The severing of the causal connection with the world determines the persistence of the last object his experience was identical with.
- The objects his experience is stuck to are of a dynamic nature (the two men walking, a whole episode) and not too long (15 seconds at most).
- The resulting experience is so real that he confuses it with real objects.

Notwithstanding all of the above, such is the force of conceptual assumptions that Sacks keeps trying to explain his condition by appealing to mental images or movies generated by his brain *within his mind* on the fly. However, a completely different explanation is available. On the one hand, we have the explanation coherent with tradition and suggested by Sacks himself – for some unknown reason, his whole cortex improvises a whole full-fledged virtual reality replica of the last object Sacks saw and generates a convincing, albeit completely useless, three-dimensional version of the last perceived scene. On the other hand, we have the explanation coherent with the mind-object identity theory. Since the umbilical causal cord between world and brain is severed, one's experience remains identical with the last cause, which is the persisting object.



A similar case is offered by positive afterimages, as when one stares too long to the Sun disk (don't do it!). If one stares accidentally at a very bright light, the photoreceptors will saturate and one will be locally blind for a few seconds or more (Craik 1966a; Craik 1940; Craik 1966b). Photoreceptors can no longer release rhodopsin until they recover. What happens, though, is familiar but surprising! Because of the temporary switching off of the photoreceptors, one continues to see the bright light of the sun for a prolonged period. Eventually, the persisting bright light changes color and – by switching through an almost fixed series of hues (Padgham 1968) – fades away. In this regard, it is interesting that Hilbert, considered positive afterimages to be the same as persistence of vision (M. H. Wilson and Brocklebank 1955, 293). I suggest revisiting positive afterimages in terms of object persistence.

### 8.5 Filtering the world: The case of afterimages

Another traditional case of alleged mental content is offered by complementary afterimages. Since Hering's time, complementary afterimages – afterimages henceforth – have been modeled as illusory mental colors resulting from adaptation of the visual system (Palmer 1999a; Jones 1972; Goldstein 2010; Bidwell 1896; M. H. Wilson and Brocklebank 1955; Purves and Beau Lotto 2002; Zaidi et al. 2012). While several neural mechanisms have been suggested (Zaidi et al. 2012; Wheatstone 1838; van Boxtel, Tsuchiya, and Koch 2010; Hofer et al. 2005; Williams and Macleod 1979; Kelly and Martinez-Uriegas 1993; Bidwell 1897; Field et al. 2010), the exact locus of such an adaptation is still vague (Frey and von Kries 1881; Hering 1878; Mach 1897; Bidwell 1896; Jones 1972; Craik 1940). For the sake of the present discussion, a complementary afterimage is a color that one sees, because of ensuing color adaptation, after staring at a saturated stimulus.

For example, you stare at a red stimulus for 15 seconds and then at a gray surface. You will see, for a few seconds, a blue-green hue over the gray surface. Since the surface is gray, the usual interpretation of this fact is given in terms of mental colors. You see a color – blue-green – that is not there. Where is it then? In your mind! This is another way of saying 'in a physical world inside your head.' Unfortunately, blue-green is not present inside your head.

The traditional explanation of afterimages is based on mental hues generated according to the color opponent model originally suggested by Hering in the 19th century (Palmer 1999a; Goldstein 2010; Hurvich 1981; Werner and Bieber 1997; Mach 1897; Jones 1972; Lycan 2002; Schwitzgebel 2011; Byrne and Hilbert 2003; Churchland 2005; Macpherson and Platchias 2013). The point here is that, like the

philosophical rat pack mentioned at the beginning, a set of assumptions mutually support each other and yet, individually, have no convincing power.

The main point is whether color opponency is a correct color space for afterimages. There is evidence that opponent colors have been chosen only because they were coherent with a mentalist model (Manzotti 2016; Pridmore 2008). In fact, complementary afterimages – as their very name suggests – were originally described in terms of the complementary color space (Livingstone 2002; Zaidi et al. 2012; Livitz et al. 2011; Bidwell 1897; Geisler 1978; Pridmore 2008; von Helmholtz 1924a; M. H. Wilson and Brocklebank 1955). If one adopts such a color model, a completely different interpretation of the same empirical evidence can be fleshed out.

Once again, two models conflict. On the one hand, we have the model based on the notion that colors are mental qualities organized as opponent poles. On the other hand, we have the complementary color model based on the notion that colors are physical quantities that have various combinations. Luckily, it is easy to verify empirically which one is correct. The acid test is offered by the most common case of afterimage known, namely using a red or green stimulus and then staring at a gray background.

In brief, according to the opponent color model, after a red stimulus one should see a green afterimage and *vice versa*. According to the complementary color model, one should see a cyan afterimage after a red stimulus and a magenta afterimage after a green stimulus. The experiment is easy to perform. Readers are encouraged to try it for themselves. It might come as a surprise to many, but, for the overwhelming majority of standard trichromats, the outcome is not green, but cyan.

Before considering the meaning of such an experimental outcome, it is instructive to note that the vast majority of scholars, whether from neuroscience or philosophy, have taken for granted (and indeed presented) the wrong empirical outcome – i.e., it is routinely claimed that after a red stimulus one sees a green afterimage and *vice versa* (Table 4). This is empirically wrong. Clearly, scholars have been so confident that colors are indeed qualities generated inside a mental space that they have not checked whether it is true – it isn't! The number of scholars who have asserted the wrong combinations of colors, both in neuroscience and in philosophy, is a testament to the force of an assumption (Palmer 1999a; Goldstein 2010; Hurvich 1981; Schiffman 1996; Macpherson and Platchias 2013; Brindley 1963; Brown 1965; Gordon 1991; Werner and Bieber 1997; Tsuchiya and Koch 2005; Robertson and Sagiv 2005; Jones 1972; Lycan 2002; Schwitzgebel 2011; Byrne and Hilbert 2003; Churchland 2005; Johnston 2004). There is, of course, an interesting narrative about the factors that led to such a widespread conceptual blind spot (pun intended) about color perception. The acceptance

of the opponent model of afterimages is likely to be due to three factors that originate in the '60s (Lang 1987; Pridmore 2011): Hurvich's revival of Hering's opponent color theory (Hurvich 1981; Hurvich and Jameson 1957; Jameson and Hurvich 1961; Hering 1964); the findings about the alleged neural underpinning of color opponency (Svaetichin and MacNichol 1958; Daw 1967; De Valois 1965); and the popularity of the multistage theory of color perception, which combined RGB and color opponency (De Valois and De Valois 1993; Walraven 1962; Solomon and Lennie 2007). Some of these findings are currently under scrutiny (Valberg 2001; Pridmore 2011; Romney, D'Andrade, and Indow 2005; Stoughton and Conway 2008).

Take as a paradigmatic example how the neuroscientist Stephen Palmer summarizes the expected yet wrong outcome (Palmer 1999a, 106, *italics mine*):

Each hue produces its complementary hue in the afterimage. *The complement of a hue is the one located in the opposite direction with respect to the central point of [Hering's opponent] color space.* Thus green's complement is red, black's is white, and yellow's is blue.

The opponent model articulates three points that are relevant for the mind-object identity theory and are thus worth considering:

- Afterimage hues are predicted by Hering's opponent color system.
- Afterimage hues are a function of the stimulus *only*.
- Afterimages are illusory additions generated by the visual system.

This model is meaningful because it shows a common pattern we have seen at work in debates about the mind. First, one starts with a wrong premise that you never question – i.e., colors are mental qualities produced by the brain within the mind. Then, one provides biased interpretations of data and conceptual crutches to safeguard the original premise – i.e., one considers only achromatic backgrounds; one misreports afterimage colors (green rather than cyan, red rather than magenta); one question-begs the data by stating that afterimage colors are hallucinations.

And yet, in this particular case, there was already a more parsimonious model that was compatible with the available data. No one other than the great German physiologist Hermann von Helmholtz had put forward a model of color afterimages based on complementary color pairs (von Helmholtz 1924b, 254):

A sharply defined negative after-image of the complementary colour will be seen then on the grey ground. Thus the after-image of *red* is *blue-green* [*cyan*]

Since then, several authors have emphasized the role of complementary colors as regards afterimages (Pridmore 2008; A. Valberg 2001; M. H. Wilson and Brocklebank 1955; Bidwell 1896; Bidwell 1897; Frey and von Kries 1881), although

their view has slowly lost center stage. Yet, their model was substantially correct and it was based on the following alternative points:

- Afterimage hues are actual colors in the environment.
- Afterimage hues depend *both* on the stimulus *and* on the ensuing surface.
- Afterimages are localized filtered color perception.

The model suggests that, by modifying spectral sensitivity, in a stimulus-shaped local area, the visual system filters off the stimulus hues from the ensuing surface, thereby revealing hues that would not be visible otherwise. The model predicts different afterimage hues from those predicted by the Hering-inspired standard model.

You stare at a bright stimulus and, because of color adaptation, you become partially blind to the color components inside the stimulus. Afterwards you watch a gray surface. Because you are now temporarily and selectively color blind, you filter off certain color components from the gray of the surface and you are left with (guess what?) the complementary components of the stimulus. Yet, the complementary components that survive filtering are physically there, as much as the stimulus color is. You see them because adaptation modified your receptor, not because you see mental hues.

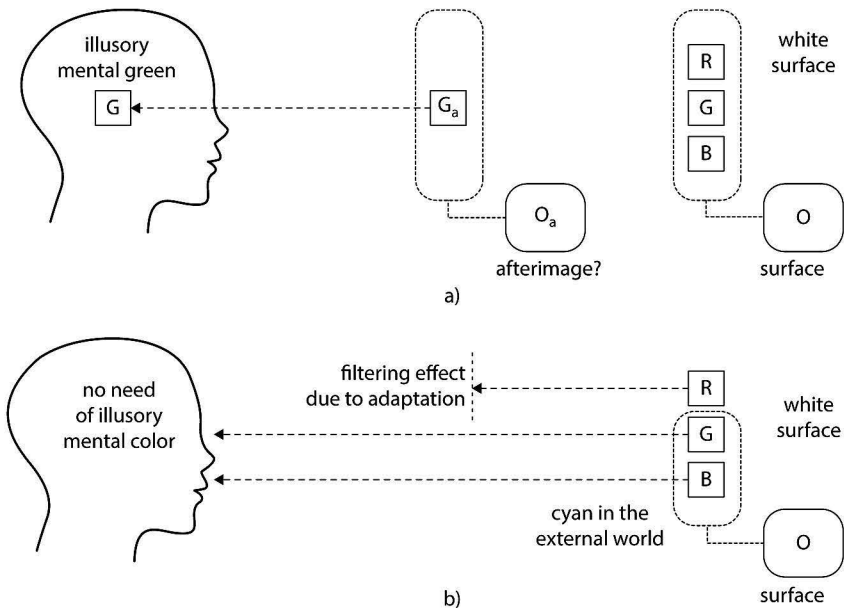


Figure 16. Widespread model (top) vs complementary filtered model (bottom)

In conclusion, the complementary model is in accord with actual evidence and it also allows us to interpret complementary afterimages as cases of color filtering (Figure 16). Thus, I see cyan – not because I see a mental cyan, but because, being temporarily red-blind, if I stare a gray patch, I will see all color components but red. Since gray contains all color components in equal measure, if I subtract red, what is left is blue and green – i.e., cyan. This is philosophically paramount! It means that I do not need any mental hue to explain the phenomenon of complementary afterimages.

The confusion between the received model of color complementary afterimages and the actual color that one perceives has become the source of hilarious logical mistakes in the descriptions of such phenomena. Out of amusement, consider the logical twist in the Wikipedia entry about afterimages ([en.wikipedia.org/wiki/Afterimages](http://en.wikipedia.org/wiki/Afterimages), accessed on 1/12/2014, *italics mine*):

Ewald Hering explained how the brain sees afterimages, in terms of three pairs of primary colors. This opponent process theory states that the human visual system interprets color information by processing signals from cones and rods in an antagonistic manner. The opponent color theory suggests that there are three opponent channels: *red* versus *green*, blue versus yellow, and black versus white. Responses to one color of an opponent channel are antagonistic to those to the other color. Therefore, a *green* image will produce a *magenta* afterimage. The *green* color tires out the green photoreceptors, so they produce a weaker signal. Anything resulting in less *green*, is interpreted as its paired primary color, which is *magenta*.

If one reads the passage carefully, the tension between the two alternative explanations and the ensuing mistake will be manifest. Repeatedly, the two color spaces are confused – first, it is claimed that there is an adaptation along the antagonist color (which, in the case of green, ought to be red) and then it is claimed that green should result in a *magenta* afterimage – and not a *red* one! Where does *magenta* come from in the above explanation? Clearly, the author is involuntarily mixing up the two accounts. Confusion follows.

One last culprit to bring to the fore is the use of the achromatic surface. Why is it so important? Because the usage of an achromatic surface is tantamount to having all color components, one will draw the wrong conclusion that the afterimage is not a perception – i.e., it seems that the mind can produce all colors while all colors are physically contained inside the gray, *ergo* white contains all colors. In fact, as Helmholtz himself had already noticed, the color one afterimages is a function of the color of the ensuing surface. If afterimages were created inside the visual system, the visual system would be able to create any color, regardless of the ensuing background. On the contrary, all findings show that the surface constrains what one afterimages. In this regard, Helmholtz wrote (*italics mine*, von Helmholtz 1924b, 255):

Corresponding results are obtained in observing negative afterimages of coloured objects on coloured background. Invariably it is principally *those constituents which were predominant in the colour of the primary object that disappear from the colour of the ground*. Thus, a green object on yellow ground gives a red-yellow after-image; and on blue ground, a violet after-image. Considering yellow as composed of red and green and blue as composed of green and violet, and supposing then that the green is diminished in both of them owing to the effect of fatigue, we should expect that the after-image in the yellow will be nearer the red, and in the blue nearer the violet.

Thus, the same stimulus (green) produces two different afterimage colors depending on the ensuing surface color (red-yellow on yellow and violet on blue). The same conclusion would result if applying Von Kries' adaptation laws. In fact, many authors have stressed such a dependence – e.g., “there is no single afterimage [...] for a stimulus color” (Bagley and Maxfield 1986, 1003). Yet, the majority of scholars (as seen before) have presented afterimages as though their color were a function of the stimulus only.

As a matter of fact, traditional afterimage reports surreptitiously and involuntarily employ two perceptual tricks that might have misled both researchers and laypeople. First, experimental setups exploit achromatic surfaces. Second, subjects' gazes are kept fixed on a predesigned region either by frames or by fixation points. Together these two conditions guarantee that the filtering does not occur on any colored part of the visual field. It is no accident that experimenters invite onlookers to experience afterimages only while staring at a *white* or *gray* surface (all italics mine): “look at a sheet of *white* paper [...] viewed against a *white* background [...] shift your eyes to the *white* rectangle” (Palmer 1999a, 106), “look at a *white* wall” (Jones 1972, 154), “look at a piece of *white* paper” (Goldstein 2010, 213), “hovering against that *gray* background” (Churchland 2005, 541), “look at a small, not-too-bright *achromatic* surface” (Hurvich 1981, 185–87), “looking at a *white* wall” (Byrne and Hilbert 2003, 5), “looking at a *white* wall” (Macpherson 2013, 13), “look at a blank sheet of *white* paper. You should see against the *colorless* background” (Brindley 1963, 85), “stare at the *white* disc” (Gage 1999). *Asking the subject to afterimage against an achromatic – white or gray – surface is a perceptual sleight of hand*. By imposing an achromatic and homogeneous surface, experimenters discreetly smuggle in the complete color palette. As further confirmation, after a green stimulus, if one stares at a cyan (or green or blue) surface, no red will be available to be filtered off. Then, no afterimage will ensue. Cyan minus red is still cyan.

Afterimages have been repeatedly explained in terms of illusory colors because scholars have progressed from the assumption that colors are mental hues concocted in a phenomenal space. This has led us to accept too easily a ubiquitous

mistake in afterimage reports – i.e., the belief that a *red* stimulus results in a *green* afterimage. In contrast, against an achromatic surface, a *red* stimulus yields a *cyan* afterimage, and a *green* stimulus yields a *magenta* afterimage. The red/green mistake is impressive in that it has been made not only by laypeople, but also by color scientists and perception philosophers (Table 4). It is a remarkable error, because it has biased the way in which stimuli have been devised and outcomes have been interpreted without anyone noticing the discrepancy. Generations of college students have been trained to believe in a wrong notion. The mistake is so pervasive that afterimage stimuli have been systematically drawn with the wrong colors, even in the most popular cases (a, b). A green/yellow American flag does not produce a red/blue flag, but a magenta/blue one.

**Table 4.** The ubiquitous confusion in red/green afterimage reports

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| <p>“The antagonistic response of RED is GREEN [...] since the opponent reaction to a RED stimulus is a GREEN after effect.” (Hurvich 1981, 185–87) “If the primary excitation [...] is produced by, say, 500 nm, it looks GREEN while the stimulus is on. If we turn the stimulus off [...] we see a RED afterimage.” (Hurvich 1981, 185–87)</p> <p>“Stare at [the yellow GREEN American flag], then quickly shift your eyes to the white rectangle beside it. You should see an afterimage of an American flag in RED, white, and blue” (Palmer 1999a, 52)</p> <p>“the negative afterimage was PINK, the complementary color to GREEN” (Brindley 1963, 89)</p> <p>“Look at the cross at the center of the strangely colored American Flag [...] Notice that the GREEN area of the flag [...] created a RED afterimage.” (Goldstein 2010, 213)</p> <p>“if we concentrate on a RED spot [it follows] a GREEN after-image” (Whitaker, Smith, and Finger 2007, 1529)</p> <p>“an intense GREEN light induces a REDDISH after-image” (Gordon 1991, 68:79)</p> <p>“exposure to a bright field of one hue (e.g., RED), induces a nearly complementary colour in the after-image (e.g., GREEN)” (Werner and Bieber 1997, 211)</p> <p>“Negative afterimages are modelled in terms of RED-GREEN contrast” (Tsuchiya and Koch 2005)</p> <p>“a RED after-image can be induced by a GREEN color patch” (Robertson and Sagiv 2005, 142)</p> <p>“after looking at a RED surface, we see a GREEN color” (Brentano 1874, 92)</p> <p>“stare at the glowing RED [and then] the usual GREEN after-image appears” (Jones 1972, 154)</p> <p>“a GREEN after-image [is] a result of seeing a RED flash bulb go off” (Lycan 2002, 18)</p> <p>“a RED object will normally leave a GREEN afterimage” (Schwitzgebel 2011, 48)</p> <p>“a RED circular afterimage, produced by fixating on a GREEN circular patch” (Byrne and Hilbert 2003, 5)</p> <p>“staring at a RED spot produces a GREEN after-image” (Velmans 1996, 193)</p> <p>“fixate the RED circle [then] you will see a circular GREEN after-image hovering against that gray background” (Churchland 2005, 541)</p> <p>“staring at a patch of GREEN [...] you should afterimage RED” (Macpherson 2013, 13)</p> |
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## 8.6 Supersaturated red and other impossible colors

Spurred on by the mojo of mental opponent hues, in the '60s a distinguished psychologist of perception, Leo M. Hurvich, put forward a hypothesis that was destined to have a long life and bias the debate about the nature of perception – if complementary afterimages were illusory mental hues, then perhaps one might devise means by which afterimages would have colors that do not exist in the physical world. This would indeed be marvelous! One would see an unearthly color: something that does not exist and cannot be seen by perusing paintings, watching exotic butterflies, mixing pigments, or building sophisticated displays! It would be evidence of a pure mental world. However, if afterimage colors are just filtered colors – as I claimed – no extra hue will manifest. Sadly, this appears to be the case. We are stuck with the colors that exist in the physical world.

In brief, Hurvich's idea was to exploit afterimages to see supersaturated hues – in particular, supersaturated red – that is usually described as a case of a color that one cannot see but in one's mind (Hurvich and Jameson 1957; Johnston 2004). Supersaturated red is taken to be a shade of red that one cannot perceive in the world but, crucially, one can afterimage. In this regard, Mark Johnston provides a convenient and philosophically informed outline (*italics mine*, Johnston 2004, 141–42):

There is a state that a subject can get into by being exposed to bright monochromatic unique green light (500 nanometers in wavelength) in an otherwise dark room for about twenty minutes. If we then turn the stimulus off, illuminate the room, and have the subject look at a small, not-too-bright achromatic surface, he will see a red afterimage. If the subject turns so that the afterimage is then superimposed on a small red background then something wonderful happens. The subject will then be after-imaging a supersaturated red, a red more saturated than any surface. A red one cannot see, a red purer than the purest spectral red light, light with a frequency of around 650 nanometers. [...] Supersaturated red is a missing shade of red, *which you can only after-image*, i.e., can never see but only have presented to you as part of uninstantiated complex of sensible qualities and relations.

The key line is that the supersaturated red is a missing shade of red that one “can only after-image, i.e., can never see.” If it were so, it would be the perfect weapon against most externalist, representational, realist, or relational views of the mind. Moreover, Johnston's formulation betrays the wait for something that many scholars have desired since Hume's missing shade of blue – namely, empirical evidence of purely phenomenal qualities.

Although the notion of supersaturated red is occasionally cited to support the autonomy of the phenomenal in relation to the representational (Hurvich and Jameson 1957; Johnston 2007; Palmer 1999b), its empirical evidence is scanty, to say the least. Actually, it all boils down to a comment about a single experimental



setup (Hurvich and Jameson 1957; Hurvich 1981). Yet, such a paucity is welcomed since supersaturated red can be thoroughly analyzed. The original report reads (Hurvich 1981, 187):

If the primary excitation in a small foveal field in an otherwise dark surround is produced by, say, 500 nm, it looks green while the stimulus is on. If we turn the stimulus off and look at a small, not-too-bright achromatic surface, we see a red afterimage. If the afterimage is superimposed on a small red field, we perceive a SUPERSATURATED red ("supersaturated" means more saturated than the saturation of a narrow-band spectral stimulus of the same hue).

To recap, both Hurvich's original account and Johnston's outline exploit complementary color afterimages – first you look at saturated green and then you see a red afterimage based on the wrong color opponent model dismissed in the previous section. According to both texts, in the right conditions, you ought to afterimage a supersaturated red. Crucially you ought not to see such a hue, but only afterimage it, since – by definition – nothing in front of you is supersaturated red. The experiment suggests the following cases:

- First, you look at a *green* patch, then you stare at a *gray* patch and, as a result, you afterimage *red*.
- First, you look at a *green* patch, then you stare at a *red* patch and, as a result, you afterimage a *supersaturated red* hue (a redder red).

Yet, this account is based on the opponent color model of afterimages, which, as we have seen in the previous section, is wrong. In contrast, what happens is that, because of the adaptation to the green patch, one becomes temporarily green-blind. As a result, one will see the other components contained in the gray patch, which are blue and red. Thus, one will see the magenta contained inside the gray. To cut a long story short, what really happens is that:

- First, you see a *green* patch, then you stare at a *gray* patch and, as a result, you afterimage a *magenta* hue ( $white - green = blue + red = magenta$ ).
- First, you see a *green* patch, then you stare at a *red* patch and, as a result, you afterimage a *magentish red*.

There are two ways to convince yourself of the mistake that both Hurvich and Johnston committed – practical and conceptual. The former is funnier. You may replicate Hurvich's experiment with four slides ([www.consciousness.it/supersaturated-red.htm](http://www.consciousness.it/supersaturated-red.htm)) – each with a square of a different solid color (saturated green, gray, saturated red, and saturated magenta). Then, after staring at the green slide for 30 seconds, by looking at the gray one, you should afterimage a colored hue. Which hue? If you quickly switch to the next two slides – the one with the red

square and the one with the magenta square – you should be able to tell which one is closest to your afterimage. It is fair to state that most non-color-blind beholders report that their experience is akin to the magenta square.

The other way in which you may convince yourself is by applying the complementary color model of afterimages seen in the previous section. The predicted result is not a supersaturated hue, but a hue halfway between red and magenta. In practice, after color adaptation because of a green stimulus, one becomes partially and temporarily green-blind. When one stares at a red patch, the patch itself is never perfectly saturated – i.e., there is always some residual white. Thus, such residual unsaturated components can offer some additional green and blue components. They are normally invisible, yet if one becomes green-blind, the filtering is sufficient to shift the balance in favor of blue and thus, since the patch was dominated by red, a magentish red follows.

Crucially, as mentioned above, an explanation of afterimages in terms of filtering and subtraction – or reduced sensitivity – has important consequences. In particular, through adaptation there is no need to generate new mental hues opposed to that of the stimulus, as in the opponent color model. Additional mental colors are not needed. The traditional model of afterimages predicts the *addition* of afterimage colors to the visual field. In contrast, the proposed model requires only the *subtraction* of specific color components.

In the supersaturated setup, the fact of looking at a red patch rather than a gray patch afterward was alleged to provide the extra kick needed to afterimage the infamous supersaturated red. The reasons why such a red patch should have boosted one's afterimage into the outlandish realm of supersaturated hues have always been a bit vague. Luckily, we no longer need to worry about it since we have seen that the whole setup is flawed. One does not see a red patch, but a magenta patch. Therefore, leaving aside the final plot twist – namely, that one ought to be able to see an extraordinary supersaturated red – reveals that even the first step in the experiment is empirically flawed. There is no red afterimage after a green stimulus. Period.

To recap, standard-sighted subjects have never experienced a supersaturated red – no matter what Hurvich suggested. Supersaturated red is a perceptual myth that gained momentum because of psychologists' and philosophers' reliance on the existence of pure appearances. While supersaturated red has been used as a battering ram to attack perceptual realism, such a choice has been overly optimistic since it is empirically flawed. If supersaturated red were a real case, it would be paramount because it would be the proof of an experience that does not have a physical counterpart in the external world. It would contradict the mind-object identity theory. Remarkably, there is no supersaturated red.

The case of supersaturated red is a myth propelled by historical confusion between Hering's opponent color theory and RGB color adaptation. Is there a

lesson to be learned? Perhaps the sparse cases of alleged phenomenal experience lacking actual physical counterparts deserve to be reconsidered, both empirically and conceptually. It might turn out that many other putative examples of endogenous phenomenal experience are just overenthusiastic interpretations of ordinary empirical evidence (Churchland 2005, for instance).

A cognate case is offered by a famous paper by Crane and Piantanida, which suggested that, in rather unusual circumstances, standard subjects may perceive additional hues that are normally forbidden to them (Crane and Piantanida 1983). The interpretation of the data was based on the widespread assumption that human subjects cannot perceive intermediate hues because of the opponent color space structure. Thus, while a subject can perceive magenta as a kind of reddish-blue or cyan as a bluish-green, one should not be able to perceive a yellowish-blue or a reddish-green. Given such premises, Crane and Piantanida devised an experiment to allow subjects to perceive such forbidden hues. The researchers exploited visual stimuli in which red and green stripes ran adjacent to each other. By stabilizing the images with an eye tracker, they held the stimuli fixed relative to the viewers' eyes. As a result, the boundaries between the adjacent red and green stripes gradually blurred and gave rise to the perception of a hue that was simultaneously red and green. Was such a hue the forbidden red/green? While some researchers have confirmed the original claim that subjects indeed perceived a new hue (Billock and Tsou 2010), other researchers have made much more moderate claims (Hsieh and Tse 2006). The heralded reddish-green might rather be a muddy, unsaturated version of red and green. However, even if the experimental result were that advocated by Crane and Piantanida, it would not represent a case of a forbidden color (at least, not in any metaphysical sense). Consistent with the traditional color opponent model, one cannot perceive reddish-green because one's retina is wired in such a way as to prevent both red and green triggering the same photoreceptors. The stabilization achieved with the eye tracker realizes a very unusual external stimulus. The change, therefore, is not in the internal machinery, but rather in the physical nature of the external object, which moves together with one's gaze. Such a stimulus allows one's retina to pick up unusual combinations of light frequencies. If the retina might work in such an extended modality, it ought not to surprise that one might perceive additional hues and properties. Such a condition would be a case of perception of unusual external chromatic objects.

In this regard, the forbidden colors are forbidden just as it is forbidden to turn one's head by 180 degrees. Yet, if one were able to accomplish such a feat, one would see the real world and not a mental concoction. If sound, these experimental outcomes would show how one's perception can be expanded by accessing new external objects and properties. The perceptual expansion, if any, will take place because of a corresponding expansion in one's environment.

## CHAPTER 9

# Subjectivity reloaded

*Without some idea of what the subjective character of experience is, we cannot know what is required of a physicalist theory.* (Thomas Nagel)

Given the fact that, by definition, no subjective property has ever been observed or measured, why have so many found the existence of subjective properties, mental images, and internal representations so convincing? In fact, we perceive the world rather than a phenomenal façade. The notion that what we perceive is not the actual world but a mental coating projected over reality is the outcome of abstract theorizing rather than an experiential or empirical fact.

I suspect that the reason behind this unconditional enthusiasm is that subjective (or phenomenal) properties – while they have never been empirically observed/perceived/felt – have been postulated to safeguard a wrong notion, namely that the subject is different from the object. In fact, once such a premise was assumed to be true, scholars and laymen had to explain an apparently impossible fact – the subject has to reach something different from whatever the subject is.

In turn, the separation between subject and object stemmed from what I called naïve materialism. We have no way to speak of the experiential qua experiential unless we contrast it with the physical. But since we have no access whatsoever to the physical by means of physics-alism, we are left only with one stuff. One stuff that would be meaningless to define mental (as dualists and panpsychists do) since it does not contrast anything. It is just the stuff our world is made of.

When I see an object, I see neither a physical object nor a mental object – I see an object. To claim that I see a mental object, I should be able to contrast it with a physics-al object, which I am not. Thus, there is just an object, which I see. And the object is there, not here.

One of the most entrenched assumptions in philosophy has been that phenomenal properties are different from physical properties. As I will argue, this is only an assumption, not a fact. Yet, it has been remolded in many different ways without a stable and convincing version ever having been achieved. The impossible feat to achieve, as I have remarked many times, is being two things at once. The subject is asked to be two things at once: the thing that it is (whatever it is, be it a brain or a soul), and something else – the object it experiences.

This is absurd. To achieve the impossible, as of Aristotle, scholars have devised impressive conceptual machineries – potency/act, form/matter, eidolon, ideas, impressions, secondary qualities, divine harmony, direct divine intervention, phenomenon/noumenon, specific energies, qualia, mental representations, and intentionality. They all strive to achieve the same impossible feat: *being two things at once*.

Is it possible to sidestep the problem altogether and, by means of identity with the object, reload the whole issue of subjectivity? I believe it is and that the previous sections have put together the required conceptual toolbox.

The reasons for keeping subjective experience apart from the physical world can be divided into two groups. On the one hand, scholars have claimed that one experiences properties that do not exist in the world. Thus they have claimed that, say, the red one experiences does not exist in strawberries and cars. On the other hand, scholars have claimed that, regardless of the properties one experiences, one's experience is characterized by attributes that are unique and that do not partake the physical world. Take Brentano's intentionality as the paradigmatic example.

The two kinds of properties pose different challenges. The exclusion of the former kind of properties – e.g., the red of a tomato – from the physical domain requires a comparison between subjective properties and phenomenal properties, one by one, a comparison that cannot be done. The second group of properties – e.g., intentionality – suggests a structural difference that is not necessarily experienced but more likely postulated to fit a conceptual gap.

### 9.1 Is the phenomenal physical?

If one is a physicalist, how can one endorse the contrast between the phenomenal and the physical? Will such a division not imply that the phenomenal exists and is indeed different from the physical? Moreover, what evidence do we have that allegedly phenomenal properties are different from the properties of the physical world and, conversely, that the physical properties of the world are unlike the properties we experience day in and day out?

For instance, consider everyday perception. You stare at an apple. The properties of your experience are red, round, and applish. Yet, the properties of your brain are grey, gooey, and brainish. Yet, once you understand that the apple is the very thing that is your experience, there is no longer any metaphysical mystery, since the brain and the apple are two different objects and thus have different properties. All objects have different properties. However, the traditional approach is different – from the fact that the brain does not have the properties of the apple, many

have inferred that phenomenal properties (redness, roundness, and applishness) are not identical with the physical properties of the brain. This was a logical mistake. They inferred that the category of the physical and the mental were different because two objects were different. In other words, the mistake is to assume that the properties of the experience, which are the properties of the apple, should be the properties of the brain. Since the physical properties of one object (the apple) do not match those of another object (the brain), it is concluded that the phenomenal properties are different from the physical ones. The correct conclusion should have been that the alleged hosting object (the brain) was a bad choice since it does not have any of the right properties.

We have no *a priori* reasons to assume, as Russell does in *the analysis of mind*, that the physical thing whose properties are the properties of our experience is our brain. It might be something else whose physical properties might be much more similar to (if not identical with) the properties of our experience. The object is the best candidate. *The apple is much better than the brain.*

Moreover, how do we know that the physical does not match our experience of the world? How do we access physical properties unless we experience them? As declared at the beginning, I embrace full-fledged physicalism. Yet what does that really mean? Do we really know what the essence of the physical is? In the literature, the discussion about the nature of physical stuff has rampaged for decades and is nowhere near any final conclusion (Montero 2013; Montero 1999; Schiffer 1990; Smart 1978; Strawson 2006). Once again we have no *a priori* notion about the nature of the physical.

Here, I suggest a different way to approach the essence of the physical world. It is an empirical *a posteriori* method. I do not attempt to grasp the essence of the physical. Rather I move from a humbler observation – namely, that all physical entities must fall under the same encompassing explanatory framework. That is the point of physics – having a common playground for all reality. Of course, this attitude does not imply that one knows in advance the essence of the physical. Actually, it does not imply that one knows anything about such a nature. The point at stake is to have a general explanatory framework inside which everything fits seamlessly. Thus, the physical does not necessarily define a specific stuff, but rather a common area. It is more like the European Single Market than like a specific kind of goods.

As a matter of fact, physics has always strived to achieve the so-called theory of everything – an overarching set of principles that everything should abide by. While this goal was perceived as more or less achievable in various times, its spirit has always been part of all attempts to provide a coherent picture of nature. Thus, here I will consider everything that fits seamlessly together as a tentative and feasible template for the physical world.

As stressed, we do not know *a priori* whether physics is made of waves, particles, or strings; whether the most fundamental stuff is matter or energy; whether there are four fundamental forces or more; or how many spatial dimensions are there. However, we expect that whatever the physical world turns out to be, it will submit to the same encompassing explanatory framework. In fact, if something were a true exception, it would count as a nonphysical phenomenon. This is what miracles are taken to be – i.e., occurrences that do not fit with the rest of the physical world. On the other hand, if a miracle happened every time certain conditions are fulfilled, no matter how wondrous it is, it would clamor for an explanation. What makes a miracle miraculous (and thus unnatural) is its uniqueness and discontinuity with the unified overarching explanatory framework. Otherwise, we would stop calling it a miracle.

Physics expands and develops through progressive inclusions. Occasionally, a revision of its core paradigms is required (Kuhn 1962). Yet no exceptions are allowed: either the newcomer is included among the existing accepted facts or physics changes to include the new fact. Roughly, there are two recurring cases. The first strategy is adopted whenever a new fact can be accommodated using the existing principles. It might not be obvious. It might take time. New evidence might have to be collected. Eventually, though, if the new fact remains an outlier, science will take it into account against all odds. In contrast, if the new fact eludes all attempts to include it in the existing framework, the second strategy will be called to the rescue. The existing core of science must be modified (changed, extended, revisited) so that the newcomer is no longer a miracle but a consequence of the structure of nature. The latter strategy, of course, must be invoked only as the very last resort and it has the hallmark of Kuhn's extraordinary science (Kuhn 1962).

In the case of consciousness, both strategies have been exploited. On the one hand, neuroscientists are collecting more and more evidence in the hope of being able to include experience in the existing picture of reality. On the other hand, they are aware that, so far, nothing in their results addresses experiences.

Being a die-hard physicalist, I assume that, if consciousness is real, it must be physical. By physical I mean material – energy and matter being two forms of the same stuff. Energy can always be converted into matter and *vice versa*. They appear to be two manifestations of the same underlying principle. Furthermore, they are both spatiotemporally located and have an actual causal role. This is not to say that I dare to provide a definition of the nature of the physical. As a physicalist, I start from the assumption that, whatever it is, experience must be physical, as matter and energy are. In this regard, I share Armstrong's view that "a man is a certain sort of material object" (Armstrong 1968, 1). Yet, I believe it is fair to disagree with his opinion that such an object can only be "his material body" – man

is an object surely, but this object is not necessarily his body. Consciousness must abide by the rules of the physical world – no ontological allowances are permitted. Like any other physical entity, from muons to raspberries, consciousness must be spatiotemporally located and causally relevant. In this spirit, the neural processes proposed by traditional identity theories are suitable candidates. Unfortunately, so far, the properties of neural processes have not matched the properties of consciousness. Acknowledging such an unresolved difference suggests looking for alternative possibilities in the realm of physical entities

If the physical is the set of all phenomena that fit in the causal mesh of nature, experience must be part of it. The mind-object identity theory proposes that the common ground is the actual object. A consequence is that phenomenal and physical properties must coincide too – not in the sense advocated by a panpsychist, which is that phenomenal properties are prodigally distributed everywhere, but in the more parsimonious scenario where physical properties are also those that we call phenomenal properties. In brief, the idea is that the phenomenal is nothing but the physical.

As I have argued at length, between physics and personal experience there is no real mismatch, neither pre-theoretically nor existentially. In everyday life, I see an apple and I grab it. Where is the mystery? The properties of my experience are the properties of the apple – what else should they be? where else should they be? I live inside something that is both my experience and my world. The mismatch arises when we add to the puzzle the anticopernican aristocratic premise that we are different from the world; or, equivalently, that the phenomenal is different from the physical.

## 9.2 One kind of property to rule them all

In philosophy of mind, many scholars have felt the need to add a phenomenal quality, aka a phenomenal character, to an otherwise quality-less world. This addition, obviously, is meaningful only if one knows – or assumes to know – that the physical world is devoid of the properties one experiences. How such knowledge is achieved is completely obscure because it would imply that one accesses physical reality without passing through one's experience. This is questionable.

In practice, for historical reasons, many have followed (a bit blindly) Galileo's advice to do violence to their own experience. Science has successfully used mathematical descriptions to grasp the functional structure of the physical world and, consequently, many mislead the abstract relational description with physics itself. Such a mathematical wireframe of nature was taken to be the real world and the world we experience everyday was downgraded to subjective appearance.



As mentioned, this is what Strawson called physics-alism. Such a step was clearly preposterous because, as with almost everything in the modern history of thought, it was biased by the unproven assumption that our experience is extraneous to physics. We have seen to what extent such a move was formalized by thinkers like Galileo and Descartes, who considered the world of appearances as something ontologically different from nature.

However, we have no way to place allegedly phenomenal qualities and allegedly physical properties side by side. Moreover, nobody has ever had any contact with a world described by pure mathematical relations. We take such a platonic world for granted because scientific mathematical models allow successful predictions. Yet, the world we live in is made neither of functional relations nor of mathematical relations; it is made of objects with properties, which are the familiar properties of everyday life. The separation between the phenomenal and the physical cannot be verified. It is not even wrong, from a scientific perspective.

Yet, the properties we experience are not immaterial phenomenal qualities coating the world – they are the properties of objects. When I look at a red apple, what is red? The apple. What is blue? The sky. What is green? The grass. Such properties have been expunged from the physical world because of platonic beliefs, wrong assumptions and, by and large, naïve materialism.

If the world is made of physical entities only – and we have no reason to think otherwise unless we convert to dualism – we are objects too. Thus, whatever we are, the allegedly phenomenal qualities must be properties of things in the world. What else could they be? We do not have a privileged ontology. We are equal to the rest of physics. The mind is not special. Thus, phenomenal properties cannot help but be properties of physics. They have appeared so problematic because:

1. They have been linked to the wrong objects (bodies and brains rather than external objects).
2. The flesh of the physical world has been stripped off, leaving only a platonic mathematical skeleton (physics-alism).

Not to mention that physics itself can't live off math alone. In fact, an important yet overlooked part of physics is devoted to measurement units. Physics without the connection to the physical world is meaningless. We need to know whether a number expresses mass, length, charge, or spin. More complex physical properties are decomposable into clusters of more elementary ones. In the end, though, any number in physics is not just a number but a point to an actual property which, in turn, is an effect within an experimental setup. For instance, '3 kg' is not a pure

number, but a way to point to a certain amount of matter. Other measurement units point to a way to do operations rather than a way to do actual stuff (for instance, position and time). However, they point to something that takes place in the physical world. They do not point to abstract numbers and math equations but to actual physical conditions. *The fact that we use numbers to efficiently express what happens in the world should not lead us to believe that the world is made of numbers.* Numbers are shortcuts to physical occurrences, but physical occurrences are not made of numbers. We know what they are made of in those cases in which we are identical with them – e.g., colors, sounds, faces, clouds, stars. And we have no reasons to think that, in other cases, they would be ontologically incommensurable. I mean. The world we are not directly acquainted with is surely different as a color is different from a taste but not incommensurable as noumenon was supposed to be.

To recap, the mathematical description of the world is not the world. It is a collection of pointers to physical properties. The latter are the same physical properties that, at various level of coarseness, constitute our experience.

Why should we take the existence of two kinds of incommensurable realms seriously? If that were the case, the two sets of properties would run into all the traditional problems that plagued dualism and idealism. Moreover, we have no reason to suppose the existence of a layer of properties that we cannot experience. One layer of properties is all we need and the best name it can get is *physical*.

Thus, physical is not the name of a particular kind of property or entity, as one might suppose. We have no *a priori* knowledge about what is requested to be physical. 'Physical' is the encompassing name we give to the democracy of properties and entities that partake in nature. *The physical is not a realm, but a democracy.* It does not matter who you are, but what you do and the fact you abide the common causal laws. Thus, they must cooperate and cannot be incommensurable. A crack in the properties of nature would result in a crack in nature itself, and we would have to choose where to stay. Either way, the chosen half would then be the whole of nature. *Nature requires unity.*

The properties of our experience have no reasons to be immaterial. Phenomenally, once we have refuted the traditional arguments against realism – e.g., misperception, hallucination and illusions – the properties we experience are also the properties that compose reality. I experience heat, pressure, shape, colors, sounds, my blood pumping through my veins, strength, pushes, pulls, weight, and so forth. These are all physical properties that, at a given time, partake of the actual world my body singles out. *I feel them because I am them.* I perceive heat because I am heat. *The being is the feeling.* I perceive color because I am color. I perceive the world because I am the world and the world is me.

### 9.3 Subjective and objective are relative

A natural objection to the identity between physical and phenomenal properties is the issue of subject-dependence. Are subjective (and thus phenomenal) properties subject-dependent? Is it not a traditional truism that one may feel the room unpleasantly hot and another one may complain of the chill? Are objective properties not subject-independent? And was this separation not the first step along the triumphant march of science that focused on measuring the objective properties expressed by quantities? Finally, is it not another cornerstone of science that the measurement apparatus – leaving aside the complications introduced by quantum mechanics – should be as unobtrusive as possible?

In fact, a simplistic version of the traditional model of subjective vs objective qualities is more or less as follows. On the one side, there are objective properties that are instantiated by objects and that are independent of the subject and the measurement device. On the other side, there are subjective properties that depend on subjects and that may vary more or less freely. Science is the effort to get to the former through the latter. Quantum mechanics is different of course.

For instance, Emile has just run outdoors and feels hot. Emily has watched the TV without moving for the whole afternoon and she feels cold. Is the room cold or warm? Now, Emile uses a thermometer and finds out that it measures 24° Celsius. Emily, a bit suspicious, uses her own thermometer and reads 24° Celsius. Leaving aside the minor differences in the air temperature in different points inside the room and manufacturing mistakes, the two thermometers read the same value. Therefore, as it is taught at high school, what Emily and Emile feel is subjective, whereas what their thermometer measures is objective. This notion has been elaborated on in various ways by adding further opposing attributes. A popular formulation is that subjective feelings are qualitative and variable, while objective measures are quantitative and precise. Thus, the former partake in a *vague subjective qualitative mind-dependent unreliable mental* world, while the latter partake in a *precise objective quantitative mind-independent trustworthy* world. Or, at least, this is the traditional view.

Such a picture – undoubtedly popular, successful, and widespread – is here called into question. The gap, taken to be a fracture in the epistemic and possibly ontological fabric of nature is reduced to a trivial practical matter. To achieve such a result, the conceptual wildcard, already outlined before, is the notion of relative existence.

In brief, if everything exists relative to something else, subjective properties are properties that exist relative to infrequent physical system – i.e., human bodies – while objective properties are properties that exist relative to comparatively ubiquitous simple systems. Thus, the former depend on human bodies, while

the latter are instantiated practically everywhere and at any time. The difference between the two groups, though, is not metaphysical but practical. *Subjective properties are infrequent relative properties and objective properties are frequent relative properties.*

The notion of relative existence unfolds in both the subjective and the objective realms. The relative spawns both the phenomenal and the physical – the two being cases of relative existence having different degrees of replicability. Let me flesh out a series of examples to outline the gist of the idea.

Consider mass. Mass is a property that is always instantiated. In our universe, there is always another body relative to which the mass of a body may take place. Given the allegedly infinite radius of such a force and the impossibility of gravitational shielding, there is always a mass pulling towards itself. Thus mass, no matter whether it is relative or not, is always instantiated.

The same holds true for all ‘objective’ properties. Either they are universally and continuously instantiated, or (at least) they take place relative to physical systems so simple that they can be replicated easily and consistently. In this way, by spreading identical measurement instruments, which are nothing but easily duplicable physical systems, the same properties take place everywhere.

Other physical properties, like position and velocity, are obviously relative, yet they are no less physical! When a train collides with a car at a relative velocity of, say, 50 miles/hour, nobody feels the need to downgrade *relative* velocity to *subjective* velocity, only because it was relative to both the train and the car. The smashing of the car against the locomotive is a fact and their relative velocity is another undeniable fact.

As a matter of fact, in physics absolute velocities have been set aside since Galileo – all velocities are relative. For practical purposes, on the Earth, most velocities are relative to the same reference frame – i.e., the ground – and thus it is usually left unsaid that there are relative velocities. The apple that lies on my kitchen table has no absolute velocity. It moves relative to the Moon at a certain speed and relative to the Sun at another speed, while remaining still relative to the table. In fact, since there are umpteen objects in the universe, the apple that lies still so innocently upon my kitchen table is moving at different umpteen velocities relative to all conceivable reference frames (Figure 3). Yet, velocity is *both relative and physical*.

It is only parochial that science developed first the notion of absolute velocity and then that of relative velocity. If we were floating in some medium (robots floating in space, dolphins floating in water) rather than primates stuck to the ground, the notion of relative velocity would come first and more naturally than that of absolute velocity. Imagine being a dolphin living in the water in the middle of the ocean. Nothing is fixed. Everything is moving with respect to everything else. No

bell tower, big mountain, or city hall represents authority or imposes an absolute reference frame. *Velocities are always relative velocities.*

Consider now more complex properties such as apparent temperature. What we call perceived temperature is a complex physical property relative to a difference in terms of humidity and average molecular energy between an external substance and our skin. Such a complex physical property is utterly different from the physical notion of temperature and yet, in everyday circumstances, it correlates well enough with the so-called objective temperature. Yet the apparent or perceived temperature is no less physical than Fahrenheit or Rømer's temperature. The apparent temperature is a property that requires a human body (or analogous physical system) to take place. In fact, it might be reasonably approximated. The National Digital Forecast Database suggests ( $T > 80^{\circ}\text{F}$ ):

*Apparent Temperature:* The perceived temperature in degrees Fahrenheit derived from either a combination of temperature and wind (Wind Chill) or temperature and humidity (Heat Index) for the indicated hour. When the temperature at a particular grid point falls to  $50^{\circ}\text{F}$  or less, wind chill will be used for that point for the Apparent Temperature.

$$\text{Apparent Temperature} = c_1 + c_2T + c_3R + c_4TR + c_5T^2 + c_6R^2 + c_7T^2R + c_8TR^2$$

Where HI = Heat Index,  $T$  = Temperature (F),  $R$  = Relative Humidity,  $c_1 = -42.38$ ,  $c_2 = 2.049$ ,  $c_3 = 10.14$ ,  $c_4 = -0.2248$ ,  $c_5 = -0.006838$ ,  $c_6 = -0.05482$ ,  $c_7 = 0.001228$ , and  $c_8 = 0.0008528$ . There is nothing metaphysically subjective in the property picked up by the above definition. It is neither apparent nor mental. It is a perfectly respectable and acceptable physical property with its own causal dignity.

The alleged difference between subjective and objective quantities is very parochial. The latter can easily take place because of physical systems, which are either very simple or replicable with great precision. Subjective properties are hijacked by the vagaries and quirks of human bodies. Because of genetic, developmental, environmental, and social factors, no two human beings are causally identical. Thus, no two human bodies bring into existence the same relative properties. This does not mean that such properties are metaphysically different from those that are brought in existence by commercial scales, Fahrenheit thermometers, or Cavendish balances. It only means that human bodies are impractical and highly inconstant physical systems. The notion of relative property allows us to set entrenched dichotomies aside – subjective/objective, quantitative/qualitative, and physical/phenomenal. It allows to set naïve materialism aside. If we had all the same bodies, there would be no subjective property.

In a similar way, the difference between quantity and quality is only of practical nature. A quantity is a number we assign to an ordered series of discernible

qualities, which are nothing but relative-and-thus-physical properties. If it were possible to make a molecule-by-molecule copy of a human body at a given time, say Emily's body as it was at 11am on July 3 2014, such a body would react in exactly the same way to identical environmental conditions (which include air temperature). It might be feasible to use such a body to reliably measure temperature everywhere. Her individual reactions might be ordered and placed in relation to the effects induced by air temperature in other physical systems and a whole, albeit impractical, system of equations might be devised and put to work. In principle, a precise duplicate of Emily's body would not behave differently from a commercial thermometer. The standard meter bar at Sèvres is no better than Emily's body; it is only more replicable and constant and easier to use.

In contrast, thermometers – the old-fashioned mercury-based kind – have a rather straightforward causal relation with the average energy in the surrounding medium: the mercury expands or shrinks accordingly. The cause and effect are bound by a relation simple enough that designing and building causally equivalent thermometers is easily done. The reason why different thermometers measure the same value does not depend on the kind of thing measured, but on the similarity between them. Since all thermometers have been designed and built so as to bear a causal relation with, say, the environmental temperature of 24° Celsius, they pick up what they have been built to pick up. *Objective is any easily replicable causal circumstance.*

If one replicated a human body and used it as a measurement device, it would not be any worse than a thermometer. It would only be extremely impractical, both because no two human bodies are alike and because human bodies tend to vary considerably with time. Human beings get hungry, thirsty, and tired, and the balance of chemicals in one's blood changes during the day. Insulin levels fluctuate, and so forth. It would be like having thermometers whose physical structure keeps changing erratically during the day.

At the beginning of the history of measurement, human bodies were often taken to be effective enough to be used as measurement instruments. The names of many measurement units are testament to this origin of physics: foot, digit (finger or toe), inch, cubit (from the Latin *cubitus*, the elbow), hand, span (from Old English, the distance between the thumb and the little finger of an extended hand), horsepower, and many others. In the past, especially for length, the human body was a reliable and repeatable physical system. At least, human beings were always available whenever you had to take a measurement. Moreover, within limits, they were reasonably uniform. Of course, after the Middle Ages, it was paramount to achieve higher standards of accuracy and thus, as of the 16th century, a big effort was devoted to defining better and better measurement devices.

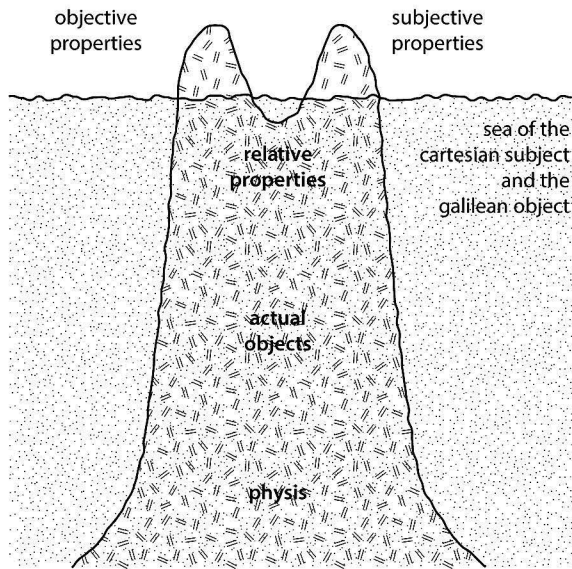
Such apparatuses had to be repeatable to a high degree. Only in such a way could they reliably pick up the same properties from the environment. Human bodies and off-the-shelf thermometers have the same role – they are physical systems that allow certain properties to produce effects and thus to exist. Crucially, though, the path from simple and highly variable impressions – e.g., Emile feels hot – to highly accurate quantitative measurements – e.g., the temperature of the water is 32.3° Celsius – is not a leap from a subjective qualitative world to a quantitative objective domain. Rather, it is a process of practical refinement of the physical systems involved in picking up causal properties from the environment. The physical systems – i.e., the measurement instruments – have become progressively more accurate and repeatable so that it has become more and more certain that the same external cause was singled out anywhere the measurement was carried out.

Beyond temperature, a whole world of more and more complex physical properties is brought into existence on a daily basis by more complex physical systems – among which human bodies are the ones we are most affectionate towards. Correspondingly, the properties that are brought into existence contingently by human bodies only are affectionately considered to be subject-dependent subjective, or apparent. They are not, of course. They depend, like everything else, on other physical systems. They are object-dependent, like the relative velocity at which a car crashes against a train.

Subjectivity has been a superfluous conceptual addition introduced to explain why an object is different under different conditions. Yet, it spread a series of misconceptions, such as subjectivity. Since an object may appear different to different beholders, what appears must be subjective. If this were true, why should it not hold for relative velocities? Why are relative velocities not explained as subjective velocities? The same object can instantiate infinite relative velocities, yet we do not deem them to be subjective. Why not? Because the relation among reference frames is easy to visualize while the relation between, say, the property called ‘apparent temperature’ and a human body is more difficult. *The distinction between subjective and objective properties is an offshoot of our ignorance about the causal processes that single out the former.* The assumption that there were two kinds of properties and that the former were subject-dependent allowed physicists to focus on a limited set of ‘objective’ properties. Yet, like absolute space, position, and velocity, the notion of an absolute objective property can be set aside. Once this is done, *the notion of relative physical properties will naturally encompass both subjective and objective properties.*

The so-called objective properties are the properties that are pulled into existence by simple physical systems – simple enough that they can be easily replicated and thus deployed to a large number of cases. In contrast, the so-called subjective





**Figure 17.** The alleged metaphysical gap between subjective and objective properties may turn out to be just the expression of a more fundamental structure of physical reality, namely relative properties

properties are those properties that are pulled into existence by bodies (such as human beings' bodies), which, with their variations, quirks, and complexities, cannot be exactly replicated.

There is no need to keep subjective and objective properties apart. They are both physical properties that cause changes in physical systems. Objective properties are simpler and more easily replicable because of the simpler systems they require to take place.

The difference between subjective properties and objective properties is neither an epistemic gap nor the offshoot of an ontological chasm. It is a practical matter (Figure 17). There is a continuum between allegedly objective quantities and allegedly subjective properties. But no change in kind occurs along the way. Both properties are physical properties that produce an effect thanks to a body – a simple one like a thermometer in the case of *objective* properties, and a complex one like a human body in the case of, say, colors, smells, or perceived, or apparent temperature. However, perceived temperature is no less physical than thermometer temperature. It is just less useful.

In conclusion, subjective, aka phenomenal, properties have been invented as a sort of conceptual wild card for coping with an over-simplistic notion of the physical world. Naïve materialism can thus be discontinued.



## 9.4 Measurement and causality

In the previous section, I argued that all properties are relative properties. Subjective properties are alike objective properties – properties that taking place because a body offers them the proper causal circumstances to be the causes of effects. An objection to this idea is that certain properties, such as length, volume, and weight, do not seem to require a causal process to complete. And yet, consider that any measurement requires a change in the physical system we use as a measurement instrument. No matter what we measure, something must happen to the device. Consider a few more cases.

The Geiger-Müller tube is filled with an inert gas such as helium, neon, or argon. When a particle or photon of incident radiation changes the gas conductivity, a pulse is generated and eventually fed to a loudspeaker to produce a characteristic sound. Cause and effect.

A weight scale is based on a spring that changes its shape because a force is applied to its ends. Cause and effect.

A mercury thermometer is a bulb containing mercury attached to a glass tube. The energy in the surroundings changes the temperature of the mercury, which, in turn, shrinks or expands. Cause and effect.

Even length and volume require cause and effect. Consider length. Length is arguably the simplest physical property ever measured. Nowadays, transit-time methods and interferometer methods based upon the speed of light are used even in everyday life (you can buy a laser distance meter for a few bucks). The ruler remains the simplest kind of length measurement tool. Does a ruler require cause and effect? Definitely. To complete the measurement, a passive ruler is not enough. The ruler has to be placed next to what one wants to measure and it must then be compared with the to-be-measured thing. The comparison process is usually accomplished by visual or tactile means. In this way, the length of the object *together* with the length of the ruler produces an effect in some further system (the distance ruler or one's eyes). The ruler alone does not measure anything. It is the ruler *plus* the object that causes something. Only when they produce an effect the measurement is complete. The passive and supposedly unchanging ruler is not the final measurement device, but a part of it. The causal end is either another device or someone's body.

Einstein provided a lively description of what the process of length measurement is and how much action it requires (Einstein 1916, 7–9):

The practice of seeing in a “distance” two marked positions on a practically rigid body is something which is lodged deeply in our habit of thought. [To establish] the distance between two points on a rigid body by means of measurements [...] we require a “distance” (rod S) which is to be used once and for all, and which we

employ as a standard measure. If, now, A and B are two points on a rigid body, we can construct the line joining them according to the rules of geometry; then, starting from A, we can mark off the distance S time after time until we reach B. The number of these operations required is the numerical measure of the distance AB. This is the basis of all measurement of length.

This passage is remarkable because it emphasizes the causal nature of the process of measurement and, I dare to add, the causal ontology of the measured property (in this case, length). Thus, all the properties we measure are actual causes that occur by virtue of another physical system.

To recap, all properties have a causal role. Some of them produce effects in our bodies and we call them subjective; other properties produce effects in simpler physical systems and we call them objective. There is, however, no metaphysical gap. The variability of the body in which the effect is consumed does not imply that what is measured is any less physical than what is measured by an almost unvarying measurement instrument. There is no epistemic gap. There are only practical differences between those properties that are singled out by mechanical devices and those properties that are singled out by human bodies. Mechanical devices and human bodies are all physical objects.

## 9.5 Experience and knowledge

If experience is noumenic with nature, we have direct access to the nature of nature (pun intended). Our experience is not a diaphanous layer masking reality. The way the world appears to us is the way the world is. The world is indeed full of sound and fury. The world is made of cars, trees, human bodies, stars, and constellations. The world is surely made of many other things that exist relative to other physical systems different from our own – sonar, infrared, dark matter. However, we can infer the existence of these worlds and objects by means of their effect on the part of the world that we are. In fact, we can be mistaken about the existence of dark matter, but we cannot be mistaken about the car we see or the pain we feel. Of course, one can be mistaken about the space-time location of the car one sees, but not about the car itself. If one has seen a car, one has seen a car and a car was seen. The objects that we reach through empirical deduction – such as gravity, muons, dark matter, and photons – might be wrong extrapolations. The objects that offer themselves in a moment of our life – such as cars, colors, and pains – cannot be unreal. They must be a part of the world we live in. We experience them because they are a part of the world that is identical with us. Everything that partakes of our experience is real and is part of our experience because it is real.

In fact, from time to time, it has been found that scientific objects – i.e., objects known only indirectly and never experienced – that were believed to be real were, in fact, immaterial. They were thought to be real because they fitted the available empirical evidence and the accepted premises. But something was wrong. Either new empirical evidence was gathered, premises were set aside, or some inference was just wrong. It happened several times in the past – e.g., the *luminiferous ether*. In contrast, if one has, say, the experience of a color, that is a fact that can't be changed. It is like a pebble on a beach. Once it happens, it will forever be a building block of reality.

Consider, once again, the case of colors. Although colors are surely what they are, the alleged relation between them and other phenomena may have been mistakenly modeled. One might believe that a color is stronger or weaker than it is. One might believe the name of the color is not the right one. Yet, whatever it is, it is so, like the pebble on a beach. Experiences are the kind of thing that exists, albeit for a moment. They are actual objects. Experiences exist. Objects exist too. *Experiences are neither right nor wrong – they are.*

The possibility of mistakes is relocated in our beliefs. One can mistake what one believes is an experience, but one cannot misexperience. Experience happens. In this regard, I share Galen Strawson's opinion (Strawson 2008, 75):

Can we apprehend the nature of concrete reality 'as it is in itself'? Can we apprehend the nature of non-mental concrete reality as it is in itself? This last is my question. Some say Yes, many say No. Against Kant, Bradley, and a huge crew of empiricists, positivists, anti-realists, and miserable post-modernists, I think there is no insuperable difficulty in the answer [...]

We do it all the time. Day in and day out, we experience the world as it is and not as a mental appearance. We experience the world thanks to the fact that we are the world we experience. Of course, this is not the same as saying that we can know what the world is. We experience the world, but knowing the nature of the world is an altogether different question. Does *apprehending* the nature of concrete reality mean experiencing it or knowing what it is? To the former option, I agree wholeheartedly. We experience the noumenal reality. And we experience it because, at all times, we are the reality we experience: *the being is the feeling*. When we are on top of a mountain and we stare at the wondrous, glorious sky, that's what the world is, in all its glory. Yet, the latter alternative is trickier. What we refer to as knowledge is largely the network of relations and all other phenomena. An equation like  $F=m \cdot a$  tells us nothing about  $F$ ,  $m$ , and  $a$ . It only expresses their functional relations. Knowledge is the practical exploitation of the functional relation between phenomena.

What we can do is understand the nature of knowledge. What does it mean to know what a phenomenon is? It means to be able to mimic and thus predict the relational/functional structure between that phenomenon and all the other ones. In short, knowledge is a practical skill. Knowledge is knowing *how*, rather than *what*.

Our knowledge of the world is neither peering inside Frege's third realm nor accessing Plato's transcendental world. Rather, it is a process through which we learn doing things by mimicking the causal structure of the world. A computer simulation is nothing but a piece of the world that mimics the causal structure of another piece of the world. Likewise, one grasps something when one acts accordingly. Knowledge is always embodied. We know that something happened so and so when our bodies mimic the proper causal connections of that fact. Knowing that Caligula was Tiberius's grand-nephew makes it possible to reply to questions about Tiberius's family. We do not access a world of abstract notions. After all, this is what computers and AI are learning to do. They absorb the causal structure of facts through big data, machine learning, and deep learning. A neural network knows what faces are when it has learned to discriminate between them and other objects. The neural network does not access any platonic idea. Neural networks have the capability to mimic the causal structure of what they try to learn. Learning  $x$  is learning how to act as one that knows that  $x$ .

Knowledge is not something additional to the physical world – it is a causal network that our bodies embody by means of language, descriptions, rules, and the like. Such tools are not necessary. In fact, natural selection has solved problems and created new forms and solutions without any conceptual tool. Birds invented flight before Leonardo.

The objects in the world have their own logic. For instance, suppose I have to prepare a curtain. It is a very simple object: a series of rings running along a long wooden rod, each with a clip to hold the curtain. While the object is extremely simple, each operation has its consequences and different combinations of operations will yield different consequences. If one makes a mistake (for instance, by inserting the rod in the wrong ring), one will have to step back and repeat everything. The ring and the rod have a certain degree of friction, which is the key to sliding the curtain. And so forth. Simple as it is, the rod-curtain-rings system has its own embedded rules and causal structure that cannot be overridden. *Knowing that is tantamount to knowing how.*

## 9.6 Perceptual error

In cognitive science, philosophy of mind, and AI, perceptual error is paramount. Perceptual error is regarded as a fundamental fact about perception that must

be integrated into any theory of perception. Obviously, as regards consciousness, the notion of perceptual error is based on the assumption that conscious experience is something that has a representational nature. Being anti-representationalist, what is the mind-object identity theory's stance on it? A short reply might be that the problem of perceptual error does not even apply. And it would be an honest reply. However, I want to address in detail why the mind-object identity theory is compatible with experiences that, apparently, do not match with reality – this is something that I have already addressed by talking about hallucinations and illusions.

One of the main features of representations is their possibility of being mistaken. I can represent a cat as being on my lap when no cat is there. Thus the representation of the cat can, crucially, be mistaken. In an account like the one presented here, such a possibility seems amiss. Yet, in this account, experiences are not representations – they are the very objects they represent. Thus, in the case of the cat, I experience a cat as being on my lap right here and now. Yet, what about those cases in which no cat sits on my lap? as when I hallucinate a cat on my lap? In such cases, we confuse experience and belief. In fact, I experience a cat, possibly on my lap. However, the place and the time are not literally experienced. I might have other experiences – a watch, other events, the arms of a clock, and so forth. From such experiences, I draw inferences and beliefs that are nice ways to describe what I would and could do given my experiences. I experience a cat and, *crucially*, I believe that the cat is on my lap now. This is not something I experience; it is something I draw a conclusion about. While a belief might be wrong, an experience is neither wrong nor right. Experiences exist. Objects too exist. An object is neither wrong nor right. Obviously there is something that is the cat and that is identical with my experience. The cat/experience is a spatiotemporally gerrymandered object. It is the physical cause of my current brain activity. Such an actual object may have occurred elsewhere and at a previous time. It is part of my experience now. I draw the wrong inference that the cat is on my lap now. At this time, though, the effect takes place, not the cause. My experience is neither the activity in my brain nor some vague notion of mental representation – my experience is the cat and my lap. Such a combination of facts, like the stars of a constellation, is what my experience is, whenever and wherever it was when it started the physical process that reaches an end in my brain now.

Consider seeing something by means of a reflection on a window. The perception is right, but I can mistake the position of what I see through the reflection. My perception is correct. My belief is wrong. The world is always right though. My experience is the world.

Of course, the above examples are connected with the so-called incorrigibility of experience. If I feel something, in a sense, I cannot be mistaken. The

fact that I feel something is a fact: an incorrigible fact. If I feel my leg hurting, there is no consolation in telling me it is a wrong feeling. I feel the pain anyway. The pain is a fact – whatever a fact is. However, it is not a phenomenal but a physical condition.

The incorrigibility of experience is a consequence of the incorrigibility of existence. If an object occurs, the object is neither wrong nor right; an object exists and that's all. A pebble is a pebble; if it exists, it is neither wrong nor right. It is just a pebble. Likewise, a pain is a pain. If one feels a pain, a pain occurs. It is a fact. The analogy between experience and existence – the fact that they are both incorrigible – is another cue in favor of their identity.

A color-blind subject does not see wrong colors. There is not a correct way to perceive colors. A color-blind subject perceives a carving of chromatic properties that is as good as that seen by standard trichromats.

Perceptual errors never occur. What we perceive is always an actual object. Perceptual error is a misnomer – it suggests that there is a wrong perception. This is not the case. Perceptions are like pebbles; they are what they are. They exist. Mistakes are a cognitive/functional/behavioral matter.

For instance, John has a representational vehicle R for red wine, and a vehicle W for white wine. John is asked to bring a bottle of red wine to a dinner. At the local mall, there is a bottle of white wine. Unfortunately for him and his guests, he instantiates R, which is the wrong mental representation. Thus John buys the wrong bottle and, unbeknownst to him, wraps a bottle of white wine. Eventually, the dinner turns out to be a disaster. Thus John made a mistake.

However, John perceived what John perceived. Either John perceived the bottle of white wine on the shelf or hallucinated a bottle of red wine. In the former case, he had wrong beliefs about bottles. In the latter case, he had wrong beliefs about the time and place of the thing he perceived. Either way, he had wrong beliefs. What went amiss was the functional connection between John's perception and John's beliefs. John did wrong but perceived right.

Thus, what might go wrong in perception is not the experience, but the connection between what one experiences and what one does. Such a connection is contingent and, although practically paramount, completely external to what one experiences.

In this regard, education and learning are processes that aim to establish the right connections between experiences and behaviors. Language is not different in this respect. We learn to say the right thing at the right time. Through painstaking efforts, children learn the right linguistic behaviors that lead to the desired results given the right circumstances. Intelligence is the capability to establish such connections. Innate syntactic engines narrow down the potentially humongous action space. Education and various conditioning mechanisms do the rest.

A wrong representation is eating a poisonous mushrooms and dying, typing the wrong password, or taking a wheel too narrowly and crashing the car. All such situations are wrong representations insofar as they lead to undesired causal paths. A wrong representation is a wrong object-action pattern – wrong relative to one's goals. There is nothing wrong in perceiving mushrooms as a bright red circular shape with nice white spots; or in the digits one types; or in grabbing the wheel and turning it sideways. They are all occurrences. They just do not lead to the desired outcome.

If one had seen an orange mushroom when the mushroom was red, it would not count as a wrong perception. If one had perceived an orange hue, the conditions for someone perceiving an orange hue surely would have obtained. However, this time, they did not occur in the preferred circumstances, namely when one stares at an *Amanita caesarea*, but unpropitiously when an *Amanita muscaria* was there. Yet, the mistake was not in the perceived hue but in the drawn inference. If one had known that *Amanita muscaria*, in some cases, might be orange too, no tragedy would have occurred.

Thus, one always perceives something that is the thing that is perceived, only one has wrong beliefs about what one is actually perceiving. Wrong beliefs about what one perceives lead to the notions of hallucination, illusion, and perceptual error.

Beliefs can be detached from what one perceives because beliefs do not bind with what one perceives, but rather constitute a mesh between themselves. Beliefs are things too. They are objects. In fact, they are caused by physical circumstances and have causal effects, only they are different from experience. They are not categorically different, but numerically different.

## 9.7 Incorrigibility

Experience has often been claimed to be incorrigible in the sense that one can be mistaken about the causes of one's experience but not about experience itself – e.g., I can be mistaken about having a thorn in my left foot but I cannot be mistaken about the pain I feel. Pain is incorrigible. By and large, our experiences are incorrigible (Rorty 1970).

Yet, many have argued against such a notion (Schwitzgebel, Huang, and Zhou 2006; Schwitzgebel 2002; Libet 1993; Carruthers 2006) based on empirical findings in cognitive and behavioral sciences that seem to increasingly undermine that confidence. In fact, there is some confusion: laypeople often confuse *introspection* and *incorrigibility*. The former is the capability to form correct beliefs about one's mental content; the latter is an ontological statement about experiences. For instance, I may draw wrong conclusions as to what I feel, what I

want, and what I think. I can be mistaken. It is a matter of belief, though, and not a matter of experience. Controlled experiments in cognitive science, neuroimaging, and social psychology have repeatedly shown how much our beliefs can be wrong about our goals, motivations, feelings, thoughts, and perceptions. Yet, they have never shown that our experience is not what it is. They have only shown that our beliefs about broadly defined mental content might be wrong. Such a result should not come as a surprise: being either right or wrong is the nature of belief. In fact, it should be obvious that current empirical findings cannot address the issue of experience. If they could, they would solve the issue of measuring subjective experience.

Thus once again, one must distinguish between beliefs and experiences – knowing and experiencing. The former might be wrong, but the latter is neither wrong nor false. The latter exist.

Moreover, in the context of an identity theory, both mind-object and mind-body would do, an experience is identical to a physical occurrence. The experience is not *about*, the experience *is* that physical occurrence. Thus, rephrasing Galen Strawson, we experience what we experience because *the experiencing is the being*: having a conscious experience is being what it is.

The mind-object identity theory provides a new solution. Experience is incorrigible because experience is existence. In other words, if I experience a red apple, there is a red apple, somewhere and at some time, that is my experience. Having an experience is thus being identical with an actual object. Existence cannot be wrong.

A red apple on a table, or a pebble on a beach, or a planet in orbit cannot be wrong. Once they exist, they exist. Objects are incorrigible. The notion of correction is yet another undesired outcome spawned by the assumption that experience and world are separate. If experience is identical with the objects the world is made of, experience will be incorrigible because existence is incorrigible.

In our culture, there is a tension between science's authority and subjective experience. Science has had a tendency to take over individual experience to do violence to one's senses. The epistemic layer strives to rule over the phenomenal and the physical. Speaking rather loosely, the strategy has been 1) to downgrade individual experience as subjective or phenomenal as a sort of unreliable appearance and 2) to postulate that the only access we have to the physical is that offered by the self-appointed community of scholars.

Of course, an identity between experience and world will hamper such an imperialistic strategy – experience is no longer mere appearance. Experience is the world we live in and the error can creep in only at the epistemic level, as it should. Science might be wrong, but not experience. The mind-object identity runs upside down the epistemic authority of science vs experience.



In fact, regardless of the present theory, whenever one has an experience, something occurs. One can be mistaken about what occurs. I can have an experience and I might believe I saw Emily when it was Eleanor. I can see a horizontally mirroring surface over the sand and I can mistake it for water. I can see an orange mushroom and mistake it for an *Amanita caesarea*. But in all such cases, the mistake is not in my experience, but in my beliefs about the place and the time of those objects in the spatiotemporally causal manifold that is the world I live in.

### 9.8 Feeling vs functioning

What about the traditional divide between feeling and functioning? Famously, Stevan Harnad deployed such a gap as an onslaught against the functionalist view of the mind (Harnad 1994; Harnad 1990; Harnad and Scherzer 2008; Harnad 2003) – the popular notion that the mind is performing functions, which are usually of computational nature. Feeling, he argued, is not like functioning. And we have no idea why a function should be felt. Neither do we have any idea how the symbols brains process are connected to their meaning. We have no physical account of representation and semantics, as formulated in terms of the symbol grounding problem (Harnad 1990).

I agree that feeling and functioning are two separate categories, but the point of the theory defended here is that feeling is being. While it is easy to argue that a functional pattern does not contain any meaning because, after all, it is only a description we impose over a causal process, it is not obvious that a piece of reality has no meaning. Why should reality be devoid of meaning? Why should the red sunset be devoid of red? Why should the violent explosion of a star be devoid of violence? Why should the stabbing of Caesar not be a murderous action?

The point is that the notion of a meaningless world, a quality-less reality, a color-less environment and so forth are all cultural artefacts of physics-alism. We do not experience them. We have devised them because, as of Galileo, qualities have been arbitrarily exiled in Shoemaker's mental dustbin. The physics-alist world made only of sterile functional/mathematical expressions is not something we experience. It is not an empirical fact. It is only an abstraction (Strawson 2008). Likewise, we do not live in the sterile, functional world. Whenever we partake of something, what we experience is characterized by its own meaning and quality. Such meanings and qualities are not a mental coating we project over the world. We experience them. The world we live in is made of them. We are them. They are the empirical substance the world is made of.

Of course, physics-alism and functionalism focus mostly on the functional relations between events and organize our knowledge about such functional

relations, exploiting abstract descriptions – the mathematical description of the physical world. Yet, the finger pointing at the Moon is not the Moon. The mathematical description is nothing more than ... a description; it is not the physical world. The physical world we experience is colorful, meaningful, substantial, and full of sound and fury. Once again, Galileo and Plato resurface under the disguise of the functionalist view of the mind. The world we experience is not created inside our minds – it is the world we live in. It is not something additional, it is it. The apple is red. The apple is the apple.

Without any contradiction, I reckon that the idea that the world is devoid of meaning is very popular. I suspect that this popularity is due to the fact that it is fundamentally true! Let me explain. In this account, meaning (experience) is not in the mind: it is not mental, it is the physical subset one's experience is identical with. It is a set of actual objects. Actual objects only exist relatively to other objects. The particular objects that compose our world exist relatively to those objects that are our bodies. Thus, the world we are familiar with – which is not by any means a mental world – exists because of our bodies. Thus, in a sense, it is there because our bodies – and thus us – are there. However, body-dependence is not subject-dependence.

Of course, this is an oversimplification of a more complex state of things. As argued above, objects do not have an absolute existence. Objects exist relative to other objects. Human bodies are a group of objects with specific features. Thus they are able to bring into existence many other objects that would not exist otherwise. If there were no human bodies, many objects would not exist. Yet, the objects whose existence depends on human bodies fall into two different categories – the objects we craft and the objects our bodies bring into existence, offering them causal shelter. For instance, without humans there would be no cellphones, magazines, and candies. But, crucially, by their very existence healthy human bodies offer to many other objects the possibility of taking place and thus of existing – faces, complex patterns, musical tunes, paintings, sunsets, rainbows, chains of events, and so forth. *An artificial object is born twice, so to speak: once when it is manufactured and a second time when it is perceived.*

Thus, the particular world we live in, to a large extent, takes place because our bodies allow it to take place. Our bodies make a difference to what the world is. Every object makes a difference to what the causally coupled world is. In this regard, our bodies are not different. They too make a difference and such a difference is the world we live in. Of course, many things in our world would exist regardless of our bodies – e.g., the earth on which we walk, the air we breathe, the chemicals we consume, and so forth. Yet, other familiar objects would not exist: the face on the Moon, the complex relations between sounds, the geometrical relations between body parts, the numerical relations between

events, and so forth. Thus, it is not a mistake to point out that, without human bodies, the world would be devoid of many properties and objects that take place because of the causal possibilities offered by them. Yet, this is not because *subjects give meaning to a meaningless world*, but rather because *human bodies, which are objects, allow more objects to take place – human bodies allow the world we are familiar with to exist*.

Such additional actual objects and worlds are often conceived of as though they were somewhat less physical. This is not necessarily the case. In short, there are objects and each object exists relatively to other objects. Thus, we can divide all existing objects into two groups: the former group is made of all those objects that take place thanks to human bodies; the latter group is everything else. It has been customary to consider the first group as being made of feelings, meaning, interpretation, and the like, while the latter group is taken to be the raw reality. This is a parochial distinction. Both groups are made of objects and only their relations with our bodies distinguish them. After all, meanings and complex features of the world are as causally effective as everything else. Are the meanings we find in the world not causes of further events? If they were not physical, how could they be causally effective?

Thus, would the sunset be what it is if there were no human beings? No, it would not. But the sunset is what it is thanks to human bodies and not thanks to human subjects. The sunset requires a proper body to exist relatively. Without a human body, the orange clouds would not contrast with the nacreous sky. The shape of the clouds would not be in relation to the underlying dark land masses. The existence of a human body – which is just an object offering a causal circumstance – allows many portions of the sky and the terrain to take place as a huge and complex object. Without that body, only simpler causal processes would be completed and, correspondingly, only simpler and fewer objects would exist. Such a difference in the composition, complexity, and number of existing objects is the difference between a world populated by human beings and a desert one. Yet the difference is completely physical.

To go back to Harnad, his argument is directed against a physical world assumed to be identical with its own mathematical abstract description: a physical world reduced to a functional wireframe. But reality is not such a skeleton. As Strawson claimed, physicalism is not physics-alism. Harnad contrasted the world we live in with an abstraction and, like many other scholars, mistook such an abstraction for the real world thereby expunging the real world inside the dustbin of the mental. Alas! the world we live in is not an abstract wireframe.

## CHAPTER 10

### A reduction

*Getting work done is the most important thing, not how it gets done.*  
(James Kendrick)

In the previous section, I argued that there is just one reality and that there are no good reasons to defend the existence of two uncommunicable enclaves of incommensurable properties. I have also argued that what we call physical properties are relative properties that partake in the whole that is nature. Each property is causally active and relative to some further object – they are relative. Such properties are also those our experience is made up. The red of the apple is both what I call a physical property and what I call my experience. The difference between subjective and objective properties is only of a practical nature. While I found this account very convincing, I am aware that such a thesis faces a formidable cohort of traditional philosophical arguments that will, I fear, hamper any good will on the reader's side. Thus I feel necessary to address them one by one. How can the presented arguments fare against the traditional platoon of problems that have kept consciousness and the world apart? Can we really complete the reduction of the phenomenal to the physical?

Since the mind–identity problem supports direct realism, one might start by considering whether such a new approach satisfies the requirements set for direct realism when comparing experiences and objects. According to D. H. Smith, the main discrepancies affecting direct realism are (Smith 2002, 8):

- (a) One possesses a genuine attribute the other lacks; (b) one bears a genuine relation to another item the other does not; (c) one exists at a place where the other does not; (d) one exists at a time when the other does not; (e) one exists and the other does not.

Perusing such a list, I am quite confident that the proposed theory qualifies to address them all. Let's check them in brief. The first issue (a) is solved because identity between experience and object guarantees that they possess all and the same attributes. There are no special attributes that one can own. The issue of their relation is solved (b) too, since identity is the only relation that remains and that is needed (the object of my experience is identical with my experience – there is no relation more genuine than that). For obvious reasons identity satisfies also (c), (d)

and (e) – being the same, experience and its objects are always instantiated together; they always exist together. To recap. The mind-identity theory supports direct realism in its purer form. We can thus proceed to consider a few traditional puzzles.

### 10.1 The hard problem

The first problem to address is the so-called hard problem, which reformulates, in modern wording, the traditional gap that has plagued our understanding of the mind. Chalmers writes (Chalmers 1996, 4):

The subject matter is perhaps best characterized as ‘the subjective quality of experience.’ When we perceive, think, and act, [...] there is also an internal aspect; there is something it feels like to be a cognitive agent. This internal aspect is conscious experience. [...] All [conscious experiences] have a distinct experienced quality. All are prominent parts of the inner life of the mind. [...] we can say that a mental state is conscious if it has a qualitative feel – an associated quality of experience. These qualitative feels are also known as phenomenal qualities, or qualia for short. The problem of explaining these phenomenal qualities is just the problem of explaining consciousness. This is the really hard part of the mind-body problem.

Stated in this way, the hard problem is both question-begging and it is hopeless. It contains many of the basic assumptions that render hopeless the problem of experience – the inner realm of the mind, the quality-less physical world, the gap between subjective and objective properties, and the purported local supervenience on the brain. In fact, the text is not a novelty. It basically restates Galileo’s words in *the Assayer* (1623). since Galileo’s time, the main point has not changed much. And yet, has such a dogma ever been observed rather than stated?

In fact, the hard problem is not so much a discovery but rather a dogma. First, one assumes that experience is alien to the physical world, and then one wonders why experience should not be physical. The hard problem is not something that we face, but something we have conceptually concocted by accepting certain premises. In fact, how could anyone check whether phenomenal properties are different from physical ones if physical properties are taken to be, by definition, impossible to experience? How do we know that physical properties are not like the properties we experience day and night? We can assume it, of course, but it is a self-defeating and circular assumption. In fact, if physical properties were really hidden by phenomenal properties, nobody could check whether they are alike. Conversely, if we couldn’t experience physical properties, how could we check whether they are akin to phenomenal properties? Either way, the hard problem would self-defeat itself. The hard problem is as undispu-

table as it has often appeared. If experience were ontologically aloof, how could we ever compare experience with physical entities to verify to what extent they (mis)match? Furthermore, if experience were not physical, we would not be able to confront it with the physical world, because, as mentioned above, it would be incommensurable.

When we look at our experience, we see chairs, colors, and people. In contrast, if we look inside our bodies, nothing matches our experience. If there is one thing that we know for sure, it is that the properties we experience are different from the properties of our brains. This difference, of course, does not entail that physical entities do not have the properties of our experience. It only means that our brains are not the right choice.

The hard problem stems from considerations of this sort – ‘I see green peas but nothing in my cortex is like green peas’ or ‘I smell a rose but nothing in my entorhinal cortex smells like a rose.’ They are both correct claims but they do not rule out the possibility that something else is like green peas or roses – namely green peas and roses. In fact, since we experience roses, peas, and apples, there must be something in the physical world that is identical with our experiences. Roses, peas, and apples are nice options that are compatible with physicalism. Neurons are not! To recap, the hard problem has been an offshoot of the assumption of the local supervenience of consciousness on the brain (or any form of mind-brain identity).

The belief that the world is indeed devoid of mental properties is naturally related to the belief that mental properties are something special that only human beings and their close relatives may aspire to. In this regard, David Skrbina reckoned that (Skrbina 2009, 1):

Considering the ‘lower animals’ (one wonders what those might be), very few people grant them anything close to mind or consciousness. Insects, worms, microbes – out of the question. Plants obviously are mindless organisms, we are told – except for those eccentrics who talk to their plants, or photograph their so-called life energy. Then we arrive at the ‘unambiguous’ forms of existence: viruses, rocks, complex molecules, atoms, subatomic particles. Surely nothing mind-like there. Such intuition runs deep in our modern world. We have centuries of objectivist, materialist science to support the view that matter is inherently lifeless, unfeeling, and psychically inert. We see no signs of such existence.

But what is a mind-like property, as opposed to a physical one? Who has ever experienced something that was not a piece of the world?

As I have argued before, the hard problem stems from a series of assumptions – the philosophical rat pack. The most conspicuous ones are that the physical world is different from the world we live in; that experience is different from what it is about; that the body is the physical basis of experience (some sort of local neural supervenience); and that conscious experience takes place in some

unfathomable inner enclave of reality. I have already argued at length against each of these assumptions.

My experience is a red, round apple. On which basis should I assume that the red, round apple is not like how I experience it? On Galileo's authority? Hardly. Science created the hard problem by oversimplifying our notion of external objects. By positing that external objects are nothing but mathematical descriptions, science has succeeded in convincing many that the familiar world we live in is only an appearance conveniently placed inside the inner subjective mind. This is an unnecessary conclusion that has led to a troubling invention: the hard problem. The identity between experience and objects solves the issue.

## 10.2 Intentionality or aboutness

Franz Brentano stated that the hallmark of the mental is intentionality or aboutness insofar as every mental phenomenon stretches towards some further object of a vague nature (*italics mine*, Brentano 1874, 68):

Every mental phenomenon is characterized by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence of an object, and what we might call, though not wholly unambiguously, reference to a content, *direction toward an object* [...]. *Every mental phenomenon includes something as object within itself*, although they do not all do so in the same way. In presentation something is presented, in judgement something is affirmed or denied, in love loved, in hate hated, in desire desired and so on. This intentional in-existence is characteristic exclusively of mental phenomena. No physical phenomenon exhibits anything like it. We can, therefore, define mental phenomena by saying that they are *those phenomena which contain an object intentionally within themselves*.

Leaving the question of the nature of the intentional or inexistent object completely untouched (Jacquette 2004; Manzotti 2006; Albertazzi 1973; Brentano 1874), Brentano's text is paramount for a series of reasons. First, it suggests that mental phenomena are radically different from physical phenomena on the basis of a fundamental property, namely intentionality. Second, such a property is ambiguously defined in two different ways – “direction towards an object” vs “containing an object within themselves.” Third, the key property of mental phenomena is parasitically dependent on the existence of objects.

Two issues are both key and deceitful. Consider the notion that mental phenomena are radically different from physical phenomena. Such a conclusion is derived from the assumption that the mental phenomenon related to a given object is indeed different from that object – thus it must be able to stretch out to reach the object. In fact, if experience and object were the same, as indeed this

book suggests, there would be no need for any stretching and thus the two phenomena would be the same. The difference is not the result of anything we experience, but is rather the offshoot of the standard view. As a matter of fact, we do not experience any intentional layer over our experience. I do not experience, *pace* Brentano, an intentional apple. Nor do I experience a mental apple, nor intentionality. I experience an apple.

The second issue is equally revealing. Brentano's text, as he himself would eventually admit, is ambiguous. In fact, it suggests that mental phenomena are directed outward towards an object that one supposes is different for them. But it also suggests that such an object is contained inside the mental phenomena and thus that it is a mental or intentional object. Here, there is no need to dig into the debate about mental acts and objects, which has already been thoroughly discussed (Albertazzi 1973; Dennett 1987; Searle 1983; Chisholm 1986). Here, it will be sufficient to note that such an ambiguity reveals the dependence of intentionality on the notion of objects. In fact, on the one hand, if the object is taken to be different from mental phenomena, intentionality will need to stretch towards the physical realm. On the other hand, if the object were a mental phenomenon, the purpose of intentionality would be self-defeating. The object would no longer be a physical object. Intentionality would stretch nowhere.

Yet, Brentano's view is useful because it gravitates towards that of the object. He stressed that the mental must be capable of something impossible for the physical. Yet, his idea of the physical was akin to that of naïve materialism – the naïve absolute object of physics. In fact, he outlined a new kind of object, the intentional object. Actually, it seems that the only reasons why it didn't proceed all the way down to the conclusion that mental phenomena are indeed identical with physical objects is the assumption that they had to be different. The oversimplistic notion of physical objects hampered his view and detained him in a dualistic framework.

If object and experience of the object are one and the same, no intentionality is required. There are neither representations nor mental states in need of a connection with their objects. No Brentanian arrow has to be shot. My experience is already there, where the object is – experience is the object. Intentionality becomes as superfluous as the *luminiferous ether* after the revision of the particle/wave dichotomy. Thus it is not a mystery that no one has ever been able to *naturalize intentionality* – a pompous expression for looking for a place for intentionality inside physics. Intentionality cannot be naturalized because there is no intentionality, only identity.

As regards the physical world, intentionality has always been utterly alien. No physical phenomenon have ever exhibited anything like it. Why should neural processes concoct exotic properties (e.g., aboutness), which physical laws neither allow nor foresee? The elusive notion of *intrinsic* intentionality has never popped



out from any physical system. Postulating the mental and hoping to find such a property in the physical world – as many scholars have done since Brentano – is doomed to failure because no physical entity has aboutness. What physical entities do is being identical with themselves. In Brentano's framework, the only solution is to consider whether a mental state is just the intentional object, which in this case is the external physical object.

As regards conscious experience, we can step back and avoid buying the whole *aboutness* bundle. Aboutness, semantics, and intentionality can be left to more epistemological levels of explanation. The issue at stake here is either whether our experience of the red apple is a biological activity that, by virtue of being about the apple, gives us the experience of a red apple or whether our experience is red and applish. The latter option, the one I defend here, has never been taken too much into consideration because of an obvious setback – the purported physical phenomenon, which is neural activity, has never had any serious possibility of being red and applish. Likewise, the naïve physical object did not qualify. But with the actual object an alternative option is available. A different option – the external object – fulfills all need for aboutness.

To recap, the presented hypothesis suggests that experience, too, is like everything else in nature – i.e., something that is only what it is. However, since *experiences are objects*, both the vehicle/content distinction and aboutness are no longer needed. The notion of intentionality and the vehicle/content distinction arose because it was held that E is physically realized by B, while everybody could see that B was not O. Thus B had to somewhat reach out for O. In contrast, if E is O, the intentionality arrow will no longer be shot. E is already where it should be. E is O. If E is O, E need not reach O. E is already there. Identity is much stronger than intentionality.

### 10.3 What it is like to be something

A widespread platitude of the current debate in philosophy of mind is that it is impossible to provide a satisfactory reply to Nagel's traditional question: what is it like to be a bat, or anything else (Nagel 1974, 436)?

[We] have at present no conception of what an explanation of the physical nature of a mental phenomenon would be [...] perhaps a new theoretical form can be devised for the purpose but such a solution, if it exists, lies in the distance intellectual future

This book has attempted to suggest that a solution to Nagel's question about the physical nature of mental phenomena might be the actual object. The actual object

is physical, real, and relative to one's body. Given a different body and the same environment, a different object will take place.

Consider Nagel's favorite example: the bat. The philosopher points out that there is no way to conceive of what the bat experiences are made of because bats' experiences are made of a radically different subjective fabric. We cannot access bats' subjective experiences and they cannot access ours. For every organism, "there is something it is like to be that organism" (436).

I agree! To experience what a bat experiences, we would need to have the same body that bats have and live in the same place that bats live. These are two conditions that are rather difficult to meet. Yet, the problem is of a practical nature rather than a metaphysical one. Bats' bodies single out their own actual objects from their surrounding physical continuum. *Homo sapiens'* bodies single out different actual objects. The two sets of objects are largely, if not completely, disjoint. Their intersection is made of only a few common objects, if any – perhaps some vague shapes and distances, some high-frequency noises. For the sake of the discussion, suppose there are no common objects at all. If between bats and *Homo sapiens* there was no common ground, bats and *Homo sapiens* would not share anything at all. Still, no metaphysical problem would follow. There would not be any need to appeal to subjectivity or other ontological gaps. It would be just like the different alimentary habits of, say, carnivores and herbivores – the sets of organisms they feast upon do not overlap. So what is the issue?

My actual objects are colors, human faces, and low-pitched sounds (I am a bit deaf). A bat's actual objects are sonar echoes, high-frequency noises, and various chemicals that I blissfully ignore. These are two different physical sets that do not overlap. The separations of the two sets is not an ontological issue. The separation is not the outcome of an ontological gap. It only is the result of two alternative clustering. Bats' bodies lump together ultrasound and certain chemicals, our bodies lump together light and low frequency sounds. No metaphysical gap. Everything is physical.

Consider electricity and gravity. At the level of energy in which we live, to the best of our knowledge, they are two different and independent physical phenomena. In principle, they do not influence each other and have different features. Does their existence pose any metaphysical problem? Not at all, insofar as they obey the usual requirement to be part of physics – to be spatiotemporally causally efficacious matter/energy stuff. My set of actual objects and bats' set of actual objects are made of the same stuff. It is only a contingent fact that something is part of our set of actual objects rather than theirs.

According to the mind-object identity theory, to experience something – e.g., a color – is to be that thing. Thus, the incommunicability between different organisms is ontologically flat. It does not follow from the impossibility of scooping

subjective characters out of individual subjective wells. The subjective characters of organisms are no more private than alimentary habits or elementary forces. It is a matter of fact that certain phenomena are different in kind from other phenomena – light is not like sound; snow is not like petrol. Why do we not wonder at how, say, gravity is different from electricity, or water is different from mercury? They are radically different, yet they play inside the same ontological playground. Likewise, once we seriously consider the mind-object identity theory, it is no longer a surprise that our experiences and bats' differ. They only differ numerically, as two physical tokens can differ.

There is no longer any need to seek an additional ingredient to characterize experience as something separate from reality. The standard view suggests that the physical world lacks consciousness while a conscious agent is such that "the property of being a thing such that there is something that it is like to be that thing" (Goff 2009, 129). The mind-object identity theory's reply is that the particular something that it is like to be a thing is the thing itself. What is it like to be a bat? It is to be the actual objects that take place thanks to bats' bodies. There is no need to add a subjective character to physical existence. There are just physical objects and they come in all manners.

#### 10.4 Points of view and perspectivalness

What about the notion of point of view? What is it in physical terms? Somehow, a point of view suggests a distance between what the beholder is and the external reality. There is a world and, then, there is a point of view about it. Point of view is usually presented, both perceptually and conceptually, as additional and, to some extent, independent entity from the reality it refers to. Moreover, the notion of point of view usually requires a beholder. A point of view is always relative to a subject that beholds. Consider Nagel's way of expressing such an issue (Nagel 1974, 442–43):

If the facts of experience – facts about what it is like *for* the experiencing organism – are accessible only from one point of view, then it is a mystery how the true character of experiences could be revealed in the physical operation of that organism. [...] After all, what would be left of what it was like to be a bat if one removed the viewpoint of the bat?

Nagel's account and the related widespread notion of viewpoint entail a contrast between an objective physical reality and such a reality when it is seen from a point of view. In physical terms, though, the whole notion is mysterious to say the least and the main reason for such obscurity is that it is afflicted by circularity. The culprit is revealed at the very end of the passage, where the viewpoint is revealed

to belong to the bat rather than to the organism. Here, the bat is not the body of the bat, but the bat-subject, of course. The bat is the subject who peers into the physical world.

Using the notion of subjective point of view to analyze the notion of experience is a clear case of philosophical question-begging. The “experiencing organism” is nothing but the dualistic mind barely disguised by the noun “organism” – it is akin to Galileo’s *animal vivente* (a living organism).

Perceptually, the traditional notion is an offshoot of the historically momentous invention of perspective that we considered earlier. The visual pyramid connects the object in the physical world to a point-like subject through straight lines corresponding with light rays. Why is the vertex paramount? Of course, because it is the ideal subject and the section of the pyramid is the world flattened to a point of view. It is only proper that the pyramid vertex be a dimensionless point. Only a dualistic subject may fit there!

What matters in this section is that the notion of point of view is derived from the existing physical world. The mind-object identity theory allows us to overcome this idea.

Thus, what is a point of view? A point of view is a set of things taking place together because of some proper causal circumstance, usually offered by one’s body. The point of view is not in the beholder – it is what happens because of the beholder’s body, which is not the beholder.

The notion of the actual object, as we have seen, is different from the Galilean absolute object insofar as it is always relative to a causal process that brings the object into existence. The actual object is what it is in virtue of a particular causal process by means of which a joint effect takes place. The actual object always embodies a point of view. It is neither objective nor subjective. It is relative and actual.

Consider perspectivalness now – i.e., the notion that everything in one’s experience is intrinsically given from a certain angle. We have already seen that the notion of the actual object, aka the relative object, is intrinsically dependent on a causal process. This means that every object is fleshed out in a certain perspective. An apple can be seen, eaten, touched, sliced – by you, by me, by a bee, by a knife. Thus, each causal process carves out a specific and different actual apple that is intrinsically different from all the others. Such a difference between different apples is perspectivalness. Such a notion was taken to be incompatible with physics because it was assumed that each object had an absolute existence. Yet, once absolute objects and properties are set aside, like absolute space and absolute velocity, actual objects always exist relatively to other physical systems. An absolute object is an object without a point of view. On the contrary, a relative object is an object that embodies a point of view. A relative actual object is a point of view.

Whenever we experience the world, a subset of the world has affected our body. There is no mystery in that – it is a causal process. It is a physical interaction in which an object produces an effect on another object. All perceptions are always cases of identity with external causes.

However, because of the variability of individual human bodies, each time the same physical continuum takes place, a slightly different portion is singled out. Each body scoops up a slightly different subset among the many possible ones. Such a variability, though, is not the hallmark of subjectivity – rather, it is the offshoot of physical structures that can vary and thus are not easy to estimate.

For instance, consider the measurement of length. If you have a 1-meter stick, you can easily obtain a length estimate of any object. The process is straightforward and, albeit not exceptionally precise, reasonably accurate. Each length measurement is a causal process that involves some stuff (the external object), the stick, and some additional favorable circumstance. The process is simple enough to be understandable and repeatable.

Consider, now, color perception. This time, the machinery required is much more complex and variable. No two individuals have the same neural structure and the sensors in the retina are unbelievably variable (Hofer et al. 2005; Hofer, Singer, and Williams 2005; Koenig and Hofer 2011). As a result, it is as though you were always using a different stick and as though each stick were used in different ways. Of course, such a hugely variable procedure would yield hugely variable results. Yet, each set of different results would not be subjective in any strong metaphysical sense – it would only be relative and variable.

Thus, we have to abandon the standard view that assumes an ideal object, absolute and unchallengeable, with its shell of subjective appearances coating it. On the contrary, the actual object allows us to have as many relative objects – i.e., actual objects – as are needed, and each is as physical and objective as a length. The fact that the stick changes with each measurement does not have to induce us to draw any fancy ontological addition.

The notion of privacy as a sort of inaccessible metaphysical enclave is unnecessary. Each measurement is different and private because each measure is the outcome of a unique causal process. To convince yourself that privacy is indeed compatible with the physical world, consider once again relative velocity. Is relative velocity not private? If we assumed to not know which system is the reference, how could we know what is the relative velocity of a body? A relative velocity is always private insofar as it depends on another reference frame. Of course, the relation between a reference frame and the relative velocity of a body is simple and can be easily sketched on a diagram. Thus, it can always be put to the fore. The relation between, say, a shade of red and the physical system that allows it to take place is several orders of magnitude more

complex. Neuroscientists have studied it for years and the details of color perception machinery are still vague. Thus, the temptation is to forget that a shade of color is a relative property just like the relative velocity of a train, only that the two processes are not comparable in terms of complexity. Privateness is a consequence from identity insofar as perceiving something requires being that something. In this regard, experience is always private since one cannot experience any aspect of reality without being one and the same with it. After all, identity is linguistically expressed by the copula *x is y*, which is a very intimate kind of union, ontologically and metaphorically. *The causal intercourse between a part of the physical world and the body is the process that allows the birth of an actual object.* Experience by identity requires a complete union between the subject and the object. As a result, one cannot experience anything that is not part of oneself. *Identity is stronger than privateness.* The actual object is both private and physical.

In some versions of *Alice in Wonderland*, the Red Queen declares that nobody else can see her gloves because she is watching them. In a similar sense, everything takes place because of another object and everything exists only relative to such an object. Thus, the gloves I see are the gloves that exist relative to my body, which are different from the gloves that the Red Queen sees, which are the gloves that exist relative to her body. Thus, since there are as many relative velocities as reference frames, so there are as many actual objects as there are objects relative to which they take place. Her gloves are then private but physical like a relative velocity is private and physical.

### 10.5 Semantics is identity

Since the introduction of 'electronic brains' in the '50s, the analogy between brains and computers has been enormously popular. Yet, there are several reasons why it may be wrong – the brain is not a Turing machine. A computer can emulate the functional organization of a brain as it can emulate the functional organization of a waterfall, without thinking in the former case and without being wet in the latter case. Like all other physical objects, the brain has no semantics.

Yet, computer memories are a tempting metaphor since they seem to have something in common with our brain memories – apparently, they do not need to share the physical properties of what they represent. On an electronic card inside a digital camera, no colors are instantiated. On a magnetic tape inside an audio recorder, no sounds are heard. Are they not a good case for the lack of actual properties we experience inside our brains? Are they not the best evidence that brain memories do not have colors, odors, and sounds?

No, computer memories are not like one's memories because, trivially, one's memories are full of colors, smells, shapes, and meanings of all kinds. For instance, if I remember a birthday party I attended to last summer on the Mediterranean Sea, I will be confronted with the pearly pink of the sunset morphing into the dark blue of the ensuing night – the iridescent light of the Moon reflected by the sea, the warm, gentle breeze coming from the sea, and so forth. When I experience my memories, I am confronted with the same properties, albeit variously reorganized, I was confronted with when I was at the birthday party. I have no experience of any intermediate medium.

If you take a series of magnetic states on a magnetic tape (or a computer memory), you have a series of physical configurations that are usually represented as a sequence of digits (or bits). Something like:

1010 0011

First and foremost, on the magnetic tape there are no digits. On the magnetic tape, there are *only* physical configurations that we have conventionally chosen to use to refer to binary digits. Some previous committee of engineers and computer scientists arbitrarily chose a particular configuration for '0' and another for '1.' For the sake of the example, I will henceforth use a convention that remains an arbitrary convention. Let's get back to our sequence of digits (physical configurations) on the magnetic tape:

1010 0011

Is it a number? An alphanumeric character? A color? A musical note? As it is, it might be all of them and countless more things. Yet, the fact is that it is none of them. It is just a sequence of physical configurations on a magnetic tape. Conveniently, though, such a sequence is used to drive physical devices that generate further physical phenomena with the right properties. For instance, if the above string is used to pilot an electronic display, and will cause a certain amount of red, green, and blue to be projected. In contrast, if it is used to pilot a printer, it will determine which alphanumeric character is printed on a sheet of paper. And so forth. In all such cases, there is a necessary step that involves moving from the magnetic tape to something different. The magnetic tape must be able to cause the occurrence of the right property in the physical world. This is what computer devices do. Printers fix inks on paper, displays emit colored light, audio speakers produce air pressure waves, and so forth.

There are no sounds, pictures, or text inside computers. However, computers pilot devices to produce music, pictures, and text. There is no mystery in such a process, and there is no need to add any strange semantic property or intentionality. The computer is a physical object that produces physical effects. In many

cases, *the effects have a lot in common with their external causes*. Such commonality encourages the belief that the intermediate steps must share something with the two extremes of the causal chain. This is unnecessary and confusing.

For instance, take a shot of a shiny red apple with a digital camera. The camera causes physical changes to the electronic configuration of the piece of silicon it has inside. After a few days, the camera is connected to a computer that causes further changes to the electronic configurations inside other pieces of silicon. Eventually, the computer causes a display to emit a color pattern that, to a large extent, is not that different from that of the apple. The color pattern on the display is physically alike that of the apple you saw a few days before. The two ends of the causal chain are physically similar in some respects. What takes place in between is not, and does not need to be akin to the two visible ends of the causal chain.

There is no need to suppose that the intermediate steps along the causal chain share anything with the extremes. To many extents, the goal of computer science is that of minimizing the differences between the two extremes so that something can be physically reconstructed. Information theory is all about it. The picture on the screen looks like the apple. However, they are two different physical objects. What happens in between is a series of physical causes and effects whose goal is that of producing a physical configuration. When we go to see a movie, on the screen we want to see something that really looks like George Clooney's or Anne Hathaway's face. The silver screen is an impressive piece of technology that does precisely that – it concocts a physical occurrence that is alike a face. A 3D printer does that in an even more tangible way by assembling matter in such a way as to reproduce a three-dimensional replica of another object.

The difference between computers and our memories is evident. The brain has neither a silver screen nor an internal printer. It does not reassemble matter/energy to create a replica of the original external object.

It is useless to introduce the notion of a mental screen, a Cartesian theater or, even more ludicrously, a neural printer. Inside the brain there is no physical object with the properties of one's experience and, crucially, of one's world. There are just neural configurations that are the causal outcome of external objects and events. This is why the metaphor of the tape or the cinema is so wrong (Grandin 1996; Chalmers 2014). The tape does not contain colors, shapes, and sounds – our memories do. The tape is only an intermediate causal step that drives the production of physical colors, shapes, and sounds – our memories do not.

If our memories allow us to experience colors and sounds, where, then, will such colors and sounds be? They cannot be in the final outcome of the causal chain (the image on the cinema silver screen), since there is no physical outcome. They



cannot be in the intermediate causal steps (or the neural configuration) because causal steps do not have the right physical properties – neither neurons have the right colors nor emit sounds. Is there a solution that does not require us to postulate *ad hoc* solutions? Yes, there is. The thing that has color and sound is not at the end of the causal chain, as in the case of the computer, but at the beginning of it. It is the red apple.

## CHAPTER 11

### A comparison with other views

*I wished by treating Psychology like a natural science, to help her to become one.*

(William James)

I am aware that, on the one hand, the mind-object identity theory's view might be a hard bullet to bite and also that, on the other hand, many may be tempted to mold it back into concurrent views. For this reason, a brief comparison with the most significant and persuasive views is mandatory. I will avoid drawing comparison with mind-body identity theories because the whole book has already addressed them at length.

In brief, in the philosophical landscape, the theory I present here is a radical form of physicalism. It is also, to some extent, a form of radicalism. It is more radical than all the other forms of externalism I have become acquainted with. It does not require any emergent property, and does not use any additional ontological layer. It exploits only the notion of actual object, which is nothing but the physical object that pushes and pulls, so to speak.

With respect to other approaches, it is the most parsimonious view I know of – there is only one kind of stuff. There is no need to resort to relations. There are just objects. If ontological parsimony is a criterion for evaluating a unifying framework, the mind-object identity theory is surely promising. All is physical.

In this chapter, I will leave aside the various popular forms of representationalism, relationalism, functionalism, and cognitivism because they are simply too far from the view advocated here. The fact is that most of these views are not really theories of consciousness; they are cognitive models with no pretense of pointing out what consciousness is. They unfold into cognitive models of various functions performed by brains. They have been forced to attempt an explanation of the nature of consciousness, but they were out of their depth since they had to fight with their hands tied behind their backs, so to speak. Take a model like Baars' central workspace, for instance – it has never had any chance to address the issue of consciousness. It has had to play at an unsubstantial level of description about what an agent does – the cognitive level. Information, computation, attention, integration, representation, and the like are the tools of the trade for any cognitivist. Consciousness cannot emerge from information and computation because they are not

fundamental stuff in nature. They are not among the building blocks of the physical world. They are useful descriptive entities akin to notions such as center of mass, meridians, and state spaces. They are epistemic but fictitious entities. In contrast, actual objects are real. Experience is real too. They are not immaterial.

### 11.1 Idealism

The mind-object identity theory is not a stripe of idealism. Idealism, at least in its school version, is the thesis that everything we experience is our own mental itches. The subject knows only itself. The subject, though, is different from the world, which is known only indirectly through the subject's itches. Idealism is based on the notion that the world is made of a subjective substance and is subject-dependent. In this proposal, there are only objects which are object-dependent.

The mind-object identity theory suggests that all we experience is a piece of the physical world whose existence, crucially, is relative to one's body, which is an object, and not to one's mind. Idealism entails that experience is mind-dependent and, crucially, different from physical reality. Here, *external objects are experiences*. In short, according to Berkeley's idealism, to be is to be perceived. According to this proposal, to perceive is existing.

### 11.2 Enactivism

The very notion of enactivism begs the question that it should answer to. In fact, it derives subjectivity from the notion of action. In turn, the notion of action is parasitical on the notion of subject. In other words, as regards consciousness, enactivism is circular.

The idea that action is necessary for a subject is indeed appealing. The original notion of 'animal' is that of something which is animated, namely that is active. Our bodies do things and thus, in a trivial sense, are active. Besides, action and perception are mutually intertwined.

Yet, inside the word *action*, a culprit hides. In fact, the word *action* is always relative to a subject that acts. An action is always something performed by a subject. Otherwise, it would simply be a causal process. Thus, what is the difference between a causal process and an action? When is a causal process considered an action? Claudius pouring poison inside his brother's ear is surely an action, and a reproachable one! The wind pushing a vial filled with poison so that its contents fill Hamlet's father's ear is an occurrence, a tragic one, but it is not an action. The

former is an action because it is performed by a subject. The notion of action disguises the notion of subject.

To highlight the dependence between actions and subjects one can consider cases in which there are no obviously available subjects. For instance, does a glacier act when it shrinks? Does a washing machine act when it runs a program coded by someone else? Did the old lilac my grandfather planted in his old house act when it destroys the nearby wall? No, of course not. Then why should a body act unless we suppose that body is the basis of a subject? Such a supposition, though, would be question-begging. The notion of action requires a subject. Thus, action cannot be used to explain what a subject is because it would fall into the trap of circularity – one cannot explain A using a notion that requires A.

Consider Alva Noë's formulation of the basic idea of enactivism (*italics mine*, Noë 2004, 1):

Perception is not something that happens to us, or in us. It is something we do. Think of a blind person tap-tapping his or her way around a cluttered space, perceiving that space by touch, not all at once, but through time, by skillful probing and movement. This is, or at least ought to be, our paradigm of what perceiving is. *The world makes itself available to the perceiver through physical movement and interaction.* [...] Perceptual experience acquires content thanks to our possession of bodily skills. *What we perceive is determined by what we do (or what we know how to do)*; it is determined by what we are ready to do. In ways I try to make precise, we enact our perceptual experience; we act it out.

What does it mean that the world makes itself available to the perceiver? What is the perceiver? Is the perceiver distinct from the world? What is the “we” that “know how to do” or that “perceive what we do” or that “are ready to do?” Isn't the whole sentence circular?

Besides circularity, enactivism is afflicted by another problem: representationalism in disguise. In fact, to tackle the issue of dreams and mental imagery, more recent versions of enactivism have shifted dangerously from the notion of action *actually performed* – which is troublesome enough – to the notion of *knowledge of the action*. This is quite amazing because it brings enactivism back to the very stance it aimed to dispatch – i.e., representationalism. Noë's statement that (Noë 2004, 2) “The central claim of what I call the enactive approach is that our ability to perceive not only depends on, but is constituted by, our possession of this sort of sensorimotor knowledge” betrays the original spirit of enactivism (O'Regan and Noë 2001a; O'Regan 1992; O'Regan and Noë 2001b), which tried to find an actual physical sensorimotor contingency enacted for every experiential state. The possession of sensorimotor knowledge is worryingly similar to having internal representations as to what one's body object can do with a given object.

For instance, on this issue Kevin O'Regan and Alva Noë stated in their seminal paper (O'Regan and Noë 2001b, 940, *italics mine*):

We propose to treat vision as an exploratory activity [...] The central idea of our new approach is that vision is a mode of exploration of the world that is *mediated by knowledge* of what we call sensorimotor contingencies.

The idea of “mediation by knowledge” is not exactly an encouraging realist stance. Moreover, it poses a series of problems – what is the nature of such knowledge? Does it not pose a double layer between us and the world? First, we do not know the world for what it is, but by means of sensorimotor contingencies. And here one may wonder as to why knowing a sensorimotor contingency should be any easier than knowing an apple – aren't they both physical entities? If they are not, then what are sensorimotor contingencies? If they are, why should a sensorimotor contingency be more accessible than the apple? Moreover, enactivists added the notion of knowledge as though one may access it without having to actually explore and thus enact the sensorimotor contingencies. Of course, since an agent is in possession of all his knowledge but experiences only a subset of it at any time, one should devise a mechanism for the activation of the stored knowledge. It seems that most of the representationalist machinery is back in place, albeit disguised under enactivist jargon. Sometimes, one cannot but wonder whether the emphasis on (en)action and life is an updated version of animism.

Finally, enactivism faces the problem of matching one's experience with actions/sensorimotor-contingencies/affordances (Block 2005) – causation vs constitution. Even if the aforementioned issues of circularity might be solved, why should body-world processes be any better than neural activity? They are physically different from what one experiences insofar as their properties do not match what one perceives. For instance, I handle an apple. My handling does not look like an apple. So, why should the handling be my experience of the apple? It does not look like it. Certainly, it plays a role in allowing my experience to take place, but is it identical with it? If it is not identical with it, why should it be constitutive? Why should my experience emerge out of it? It is not obvious whether there are any substantial differences between enactivism and functionalism. They both focus on the interaction between body and environment and end up by postulating an additional level of reality (the knowledge of sensorimotor contingencies) that mediates the interaction between a noumenal world and an undefined agent.

Yet, to a certain extent, the original version of enactivism – which was focused more on actual enaction – seems to suffer from the same three shortcomings: circular dependence on the notion of animal/perceiver/subject/agent; mismatch between sensorimotor contingency and experience; an insufficient repertoire of sensori-motor contingencies; and internal representations disguised as knowledge/mastery of sensorimotor contingencies.

In contrast, the mind-object identity theory is much simpler – one’s experience is the object one experiences. The interaction between the world and the body singles out, causally, the external object. Actions have no privileged status. There are only causal processes and objects. There is no need for mediation, no need to implicitly postulate a subject, no need to (en)activate anything. Crucially, the thing one experiences is not the interaction – i.e., sensorimotor contingencies or affordances – but the object itself. The interaction brings the body into existence, but *interaction/action/enaction is not experience*. The object is the experience.

### 11.3 Direct realism

It is interesting to compare this approach with direct realism in some of its versions. Of course, I cannot do justice to the many variants that this view has recently spawned (Siegel 2010; Brewer 2006b; Hobson 2011; Dunn 2008; Smith 2006; Siegel 2006; Le Morvan 2004; Bonjour 2004; Cohen 2009). However, I can point at some common features of widespread models of direct realism that contrast with the mind-object identity theory.

First and foremost, I believe that this new approach is indeed a form of direct realism insofar as it states that the world is what it is and that because of our experience the world itself is available in the most intimate and faithful way – identity. If my experience of the apple is the apple, nothing will be left out – no intermediate entities mask the nature of reality. In my experience, I am one with the world. I dare to say that this approach may be dubbed a form of radical direct realism, possibly the most radical version of it.

However, the proposed approach is also different from other versions of direct realism that I am aware of, since they implicitly assume a separation between the subject and its objects. In brief, a standard direct realist account suggests that one can access the nature of objects and yet one is distinct from the objects one knows – “Direct realism is the claim that we can be directly aware of objects that themselves possess such a stratum” (Smith 2002, 2).

Contemporary realists have backed up the notion of the subject as something – surely not immaterial – separate from what it knows. The former assumption has an important consequence, which is a further point of distinction from the proposed approach. If the subject and the object were separate, the object should be absolute and autonomous, and surely it could not be subject-dependent because such an outcome would defeat the whole realist endeavor. Thus, for a realist, the object should be absolute and a yet-unknown relation should hold between subject and object. Overall, then, direct realism is committed to a rather complex ontology.

For the sake of discussion, I compare this approach with Brewer's object view (Brewer 2006b; Brewer 2006a; Brewer 2009), which I have already mentioned as regards illusions. Brewer outlines the thesis that (Brewer 2011, 94):

The most fundamental characterization of our perceptual relation with the physical world is [...] a matter of conscious acquaintance between perceiving subjects and particular mind-independent physical objects.

As with most contemporary direct realist stances, Brewer's view is based on notions (such as subjects, relations, and presentations) that are rather expensive ontological additions. What are they in a physical world? Has anyone ever seen a relation? A perceptual relation? A conscious acquaintance? What does it mean that something presents itself to us? Moreover, what is *us*? The notion that a mind-independent physical entity is such because it does not depend on its appearance is particularly worrisome, because it implies that there are indeed appearances that are distinct from things.

Likewise, I do not understand sentences like "in perceptual experience, a person is simply presented with the actual constituents of the physical world themselves" (Brewer 2006a, 168). What is a person? Is it something different from an object? Can I see, so to speak, a person with a microscope? I doubt it. Furthermore, how does something present itself to a person? Such claims appear to me to be recipes for future metaphysical disaster.

Such formulations suggest a difference between persons and constituents. The very notion of relation appears to me to be a form of dualism in disguise. In fact, Brewer expresses a mentalistic attitude (Brewer 2011, xii):

Perception is a matter of our standing in relations of conscious acquaintance from a given spatiotemporal point of view, in a particular sense modality, and in certain specific circumstances of perception, with particular mind-independent physical objects.

The only obvious physical items in the above account are expressed by the last two words: "physical objects." All the rest is, to various extents, of a mental nature – from "conscious acquaintance" to "sense modality," from "perception" to "circumstances of perception." Even the notion of "spatiotemporal point of view" is not immune from being ancillary to the notion of subject. A satisfying realist and physicalist solution to perception should come in the form of 'Perception is X,' where X must be totally mind-free.

I am very sympathetic with what is labeled the empiricist insight, namely that "the core subjective character of perceptual experience is given simply by citing the physical object which is its mind-independent direct object" (Brewer 2009, 171). But I wonder how this view can stem out of a "relation between a perceiving subject and the object presented" (Brewer 2009, 171).

What is perception, then, in purely physical terms? A mechanism of some sort must be proposed. The mind-object identity theory puts forward a working and verifiable hypothesis – perceiving  $x$  is being identical with  $x$ . It suggests focusing on the causal dependency between the object and the body and the identity between the object and the mind. The objects one experiences are not mind-dependent but, crucially, *contingently body-dependent*.

#### 11.4 Russellian monism

Russellian monism is the thesis that we do not experience the external world, but the brain that our mind is identical with. The view moves from the assumption that we only have direct access to the external object by means of the changes in our brain. Therefore, the only experience we have of the physical world is provided by our feelings and sensations, which are modifications of the brain. Thus, whatever we observe, we see only our brains and their changing states, although we mistake them for external objects. At the same time, our brains are physically like what we see in the world and are like what we feel.

The contemporary discussion originated with Bertrand Russell's remarks about the accessibility of matter. Russell stressed that physics does not really address the intrinsic character of matter. Physics provides an abstract description of what matter does, but it does not tell us anything about what matter is. To overcome such an obstacle, Russell suggested turning the problem upside down. His main argument was that we do not know anything about the world, but we have direct access to the intrinsic character of that part of the world that we are. Thus, paradoxically, when neuroscientists examine a patient's brain, they don't see the patient's brain, but their own brain. What is matter made of, then? According to Russell, matter is what we experience. But such stuff is located inside one's head. Thus, what we take the world to be – particles and objects – is not what the world is. Rather, it is what is located inside our head and what we assume the world to be. While this approach is interesting insofar that it challenges the current standard view, it keeps locating one's experience inside one's head. Moreover, it places the external world hopelessly out of reach insofar as what one perceives is always one's brain. One never gets out of the brain. The brain is conceived of as a biological monad.

Russell's view is more twisted than it seems. For clarity, let's use my favorite example – seeing an apple. According to Russellian monism, when I see an apple, the perceived qualities of the apple – red, round, and applish – are the physical properties of my brain at the time of the apple perception. The properties of the apple are utterly unbeknownst to me. Of course, this is different from



Kant's phenomenon/noumenon since, as regards my brain, my experience grasps its intrinsic properties. Thus, I experience my brain and I believe, mistakenly, that the brain is the apple. Of course, since my brain undergoes changes resulting from the interaction with the apple, I manage to deal with the apple. It is conceivable that my brain changes are functionally isomorph to the apple. Otherwise we could not deal with the world.

Yet, Russell's proposal encounters a series of obstacles. First of all, it is unclear who should be experiencing the brain state and why. Second, is Russell monism different from the traditional mind-body identity theory? Apart from stating explicitly that the properties of the brain must be identical with such properties, I don't see any big difference.

Third, while it might be conceivable that all the qualities of the world are only qualities of the brain, it seems unlikely since, if we accept our standard model of what a brain is, it does not seem like the right place to host all kinds of qualities. The structure of the brain, from a physical perspective, is homogeneous and consistent. Why should my brain be brimcrammed to the brim with all kinds of properties, such as those that so obviously appear to populate the world?

Fourth, and more worryingly, how do we know brains exist, since brains are among the objects that, according to Russell, we know indirectly by getting acquainted with our own brain? There is circularity in Russell's argument. In fact, according to Russell, the external objects and their properties are states of our brain. Thus, when I see an apple, I see a piece of my brain. Yet, how do I know that I have a brain? And that the things I see are pieces of another thing, which is my brain? Because I have seen other human bodies and their brains (usually in pictures). But then, whenever I've seen a brain (either in a real body or in a picture), I haven't really seen it, because we do not see external objects but pieces of our brains ... which we have never seen. Thus, if Russell were right, we could not know whether we have brains; therefore, Russell cannot be right.

Finally, a final objections holds. Why should the fact of being closer to the body result in the fact of being closer to the mind? Russell makes a hypothesis that I share, namely that if our experience is, say, *red*, there must be something in the physical world that is real, physical, and, necessarily, *red*. The property of my experience must correspond to the property of a physical entity that is the thing my experience is. And, of course, I agree that, if our experience is real and thus physical, the properties of the experience must have a place in the physical world. But, crucially, why should such a thing be the brain? Or any other subset of the body? How can Russell be certain that his experience is inside his head? As far as he knows, his experience might be everywhere; therefore, why should it not be in the very objects that are the most logical choice for such properties? Where is the red of the apple I experience? In the apple! What is the experience of the apple? It

is the apple! Why should we not make the conceptual leap and place experience where the apple is? If we shifted the alleged location of experience from the body to the external world, Russellian monism could indeed be morphed into something very similar to the proposed mind-object identity theory.

Basically, Russellian monism tells us that, since we can only be identical with a physical phenomenon and since such a physical phenomenon can only be the brain, we must conclude that the properties we attribute to experience can only be the properties of our brains. This argument is very much like Block's neural supervenience, only that Block halts one step earlier and does not dare to attribute the properties of the world we experience to the brain. Block reckons that the properties of the brain must be those that science reports. Thus, Block faces an unsolvable mystery, while Russell bites the bullet and faces an argument that is either absurd or circular and ultimately defeats itself. In contrast, the proposed mind-object identity theory does not face any such obstacles, since it does not commit to the thesis that the brain is the only thing that can be our experience. The mind-object identity theory instead suggests that experience can only be a physical phenomenon and that such a phenomenon is the external object. In this way, we respect Russell's original insight, but we do not attribute impossible properties to brains. The properties of our experience are the properties of external objects. It is a form of physicalism, of course, that avoids the absurd consequences of Russell's version of it.

### 11.5 Panpsychism

Recently, panpsychism has attracted a lot of interest, particularly given the persistent failure of traditional physicalism in finding anything resembling one's experiences inside the central nervous systems (Strawson 2006; Mørch 2014; Strawson 2005; Skrbina 2005; Bruntrup and Jaskolla 2016; Holman 2008; Seager 2001; Manzotti 2008; Majeed 2013; Coleman 2013; Sieger 1995; Silberstein 2010; Van Cleve 1990; Skrbina 2003; Skrbina 2009). For the sake of discussion, I will take panpsychism as the thesis that "mind and consciousness are ubiquitous in nature" (Skrbina 2009, 2), or that "mind is a fundamental feature of the world which exists throughout the universe" (Seager 2001), or that "everything has a mind" (Chalmers 2015, 246). Such a view tries to sidestep the problem about how the mind emerges only from subjects. Mind does not emerge because mind is already everywhere.

Yet, the thesis implies that mental attributes are distinct from physical ones and are liberally spread everywhere. The notion that "mind is a fundamental feature" entails that mind is also an *additional* feature. Thus, it might not be there. By the same token, "everything has a mind" entails that the mind is different from what

owns it. And so forth. Panpsychism appears similar to the thesis defended in this book, but it is not. In fact, my view is rather a form of *no-psychism* insofar as it does not require the existence of any mental attributes as opposed to physical ones.

Leaving aside the historical roots of panpsychism, which was rather popular in the pre-Galilean world (Skribna 2005), the point is whether we really need to add anything to the physical picture of reality. The mind-object identity theory states that we do not need anything but physical reality. Nature is physical and there is nothing that does not fit with it. The view I present here suggests that the notion of subjective properties was introduced as a crutch to safeguard a naïve notion of the physical world.

The idea that we need something additional to the physical world and that, as in panpsychism, such an additional ingredient is spread everywhere is no longer necessary. Tantamount to dualism, panpsychism postulates that there is a mysterious mental juice, that we experience in our brains, only that such additional ingredient is indeed freely distributed everywhere. But the crux of the matter is whether the world needs such additional property/substance.

The mind-object identity theory is not a panpsychist stance. I do not claim that external objects have phenomenal properties smeared over them. The apple is not conscious. Nor has the apple an additional conscious/phenomenal nature. The apple is just the apple. Panpsychism is a form of prodigal dualism. Why should we posit any additional phenomenal property in addition to the properties the physical world has. Physical properties are *both* the familiar properties of the world we experience *and* the properties of our experience – the two being the same. There is no need for an additional and unfathomable phenomenal layer.

In this book I have argued again and again that the notion of mental attributes, mind, conscious experience, and phenomenal character has been added because of a mistake in the choice of the physical thing that experience is. The mistake was to place the mind inside the body – or to take the body as the supervening basis of the mind – rather than understanding that the mind is just the external object. Accepting the mind-object identity theory leads to a complete reduction of the mental to the physical, and thus eliminates the need for panpsychism. The physical is enough.

### 11.6 Soul-less Descartes

There is a sense in which the mind-object identity theory resembles Descartes' notion of the mind. This is not a bad sign, given the success that his view has had. For the sake of the discussion, let's consider a scholastic notion of Descartes' view

of the mind – henceforth referred to as the Cartesian mind. The mind is a collection of immaterial ideas that represents the external world by similarity. There is no additional haecceity but the bundle of such ideas – there is no self over and above one's ideas. A particular subject is nothing but a bundle of ideas. The idea of the red round apple resembles the red, round apple in everything but its being made of matter. Ideas are made of one substance (soul) and objects are made of a different substance (matter). An object and the corresponding idea share the same form. Causal processes are possible through the pineal gland that connects soul and matter, ideas and objects.

Surprisingly, there are some commonalities with the mind-object identity theory: the mind is different from the body; we are not our bodies; the mind is a collection of ideas (here, actual objects); there is no haecceity; having an idea is that idea being part of the bundle one's mind is. This is where the commonalities end. But they are nevertheless remarkable. In some sense, then, the mind-identity theory is an updated version of the Cartesian mind; the mind-object identity theory is a soul-less version of Descartes. It is not by chance that mind-identity theories have often been accused of being a form of Cartesian materialism (Bennett et al. 2007; Rockwell 2005; Dewey 1916).

In fact, regardless of the soul-matter's difficult relation, Descartes' view of the mind was a lot clearer than subsequent theories of the mind, which have appealed to all kinds of obscure relations between subjects and objects. The main problem of Descartes was that, once dualism had been set aside, the brain was not the right thing to contain anything like one's ideas.

Yet, classic dualism contained at its onset the seed of contemporary brain-world problem. How is it possible that the brain experiences the world, if the brain is not the world? In nature, everything has only the properties it has. The brain is no exception. The mind-identity theory takes the leap and places the mind on the other side of the brain/world dichotomy. The mind is not in the brain, but in the world. The mind is the world.

The leap towards the object allows to revisit the classic Cartesian picture of the mind. Actual objects are Descartes' ideas. The mind is a bundle of objects. The mind is not the body. One experiences an object when that object is part of the bundle that one's mind is. As in Descartes, there is no need for strange relations, intentionality, haecceity, and transcendental subjects. I experience a red, round apple because the red, round apple is part of the bundle I call my mind. Only it is not the idea of the apple but it is the apple itself.

However, differently from Descartes, there is no need of a soul. Objects are all we need. Actual objects play the role of Descartes's ideas. The idea of a red, round apple is nothing but the red, round apple. Thinking is being – *cogito essendi*.



## CHAPTER 12

# The last blow to the narcissism of man

*Because consciousness is both so fundamental and so ill understood, a solution to the problem may profoundly affect our conception of the universe and of ourselves.*

(David Chalmers)

It is a truth universally acknowledged that all human beings feel themselves to be located where their bodies are. Such a feeling, together with a series of historically successful assumptions, has led to an almost impossible conundrum – if the mind is separate from the world, how is it possible for the former to experience the latter?

Yet, if we look inside our body, we will not find anything like our experience of the world. We will not find anything like our perceptions, feelings, emotions, and thoughts. So far, inside our central nervous systems, neuroscientists and anatomists have found only neurons, neurotransmitters, chemical substances, glia, and blood. While the scientific understanding of our neural machinery must be counted among the most astounding achievements of human ingenuity, it is fair to state that, as regards our conscious experience, no conclusive evidence has been shown.

Such a lack of empirical confirmation about one of the most widespread beliefs should raise some concern, especially when compared with the impressive amount of resources that have been deployed to peek, probe, and peer inside the human central nervous system hunting for consciousness. As regards consciousness, the disproportion between the effort and the actual outcome should push scholars to consider radically different alternatives.

The manifest difference between our body and our experience – the latter assumed to be different from the world – has led many to court the notion of an immaterial mind. However, such an option will no longer be available, if one is a sincere physicalist. For a physicalist, there can only be physical entities (i.e., objects). The brain, the body, and the apple are all objects. If the body had an experience of the world, the usual problem would arise – how is it possible that an object has an experience of another object? How can a brain have an experience of an apple without being the apple? How can brains borrow the properties of the external object without changing their own? In a physicalist world, the mind–body problem becomes the *object–object* problem, and it is hopeless.

Of course, the premises from which such a situation arises, notwithstanding its tragic philosophical development, have never been questioned too harshly. Why? I suspect that such indulgence has stemmed from an all-too-human fondness for the privileged position of man, which is achieved by means of attributing special powers to the brain. In this regard, David Skrbina recently observed that (Skrbina 2009, 10):

Philosophically speaking, we humans are an arrogant lot. We quite easily see ourselves as different, special, unique, even superior to the rest of nature. We think ourselves more valuable, more intelligent, more powerful than every other creature on this planet.

Human beings cherish to conceive of themselves as though they were somewhat distinct from the physical world. Yet, in science a common pattern has been that many important steps have requested the sacrifice of some presumed privilege on our side – the special position in space, in time, inside the domain of the living organisms. Copernicus jettisoned the central astronomical place that earth had treasured for centuries. Charles Lyell did the same with time, Darwin with the animal kingdom and Francis Crick with life itself. Could it be that the last stand of the alleged human uniqueness – namely being subjects in sea of objects – is doomed to fall too? Are we not just objects among objects?

As a matter of fact, if we watch a human's body and peruse its organs, apart from the brain, no special powers will shine out of it. No spiritual light will glow in the dark. Everything looks so ordinary. Of course, all our organs carry out wonderfully complex functions. Yet, what they do, to the best of our knowledge, can be explained using the same terms used for all other physical phenomena: matter/energy and causal processes. The organs of a shark perform their functions equally well, if not better. Yet, no ontological waivers have been asked for them. Why should the human brain be any different? Why should the brain possess any special property that violates the uniformity of the physical? Isn't it a bit premature (and immature, too) to ask for special privileges?

A lot of effort in the last few decades has focused on finding justifications for the existence of special powers in the brain. The form of the argument has always remained the same – since the mind does not fit inside nature, the brain must do the trick, but since the brain too is part of nature, the brain must be special ... and we too ... hurrah! Thus, it has been suggested that the brain is capable of producing phenomenal qualities, which, of course, are not to be found anywhere else, together with all kinds of ontological super power such as phenomenal fields, *semantics*, intentionality, *aboutness*, qualia, Tegmark's *perceptronium*, Tononi's *phi*, and so forth. All kinds of white rabbits have been pulled out of gray brains!

Yet, all such fanciful properties have a series of suspicious common characteristics: they are different from the brute physical world (you need something extra to endorse the mind, of course!); they cannot be found elsewhere, only in one's mind or brain; and they cannot be observed like all other physical facts – e.g., hemoglobin or electrons. Phenomenal experiences are just like the emperor's new clothes. The brain is alleged to instantiate new and *unobservable* properties! As I have stressed umpteen times, this is all very suspicious.

It is highly suspicious that phenomenal experience is both the very thing that our scientific models miss and the very thing that cannot fit within nature. Such a situation should suggest some caution, because mental properties appear to be akin to patches that a lazy schoolboy devised to fit a wrong notion of the mind. Perhaps these notions are a measure of our ignorance of the nature of the mind rather than a sign of a fracture in the fabric of nature.

Famously, Sigmund Freud pointed out that scientific revolutions have resulted in mortal blows to our self-esteem (Freud 1920, 242):

Humanity has in the course of time had to endure from the hands of science two great outrages upon its naive self-love. The first was when it realized that our earth was not the center of the universe, but only a tiny speck in a world-system of a magnitude hardly conceivable; this is associated in our minds with the name of Copernicus, although Alexandrian doctrines taught something very similar. The second was when biological research robbed man of his peculiar privilege of having been specially created, and relegated him to a descent from the animal world, implying an ineradicable animal nature in him: this transvaluation has been accomplished in our own time upon the instigation of Charles Darwin, Wallace, and their predecessors, and not without the most violent opposition from their contemporaries. But man's craving for grandiosity is now suffering the third and most bitter blow from present-day psychological research which is endeavoring to prove to the 'ego' of each one of us that he is not even master in his own house, but that he must remain content with the veriest scraps of information about what is going on unconsciously in his own mind. We psychoanalysts were neither the first nor the only ones to propose to mankind that they should look inward; but it appears to be our lot to advocate it most insistently and to support it by empirical evidence which touches every man closely.

Bravely, I wonder whether the mind-object identity theory will be one such blow. It puts forward a radical hypothesis – we are nothing but objects among objects – that disposes of the last metaphysical barrier between us and nature. The notions that formed a sort of last enclave in which we may feel different from pebbles, stars, rivers, and clouds – e.g., subject, self, ego, mind, person – will survive only as practical labels. Yet, the final unification should not come as an entirely unwelcome surprise. After all, this is only the necessary and predictable outcome of physicalism – we



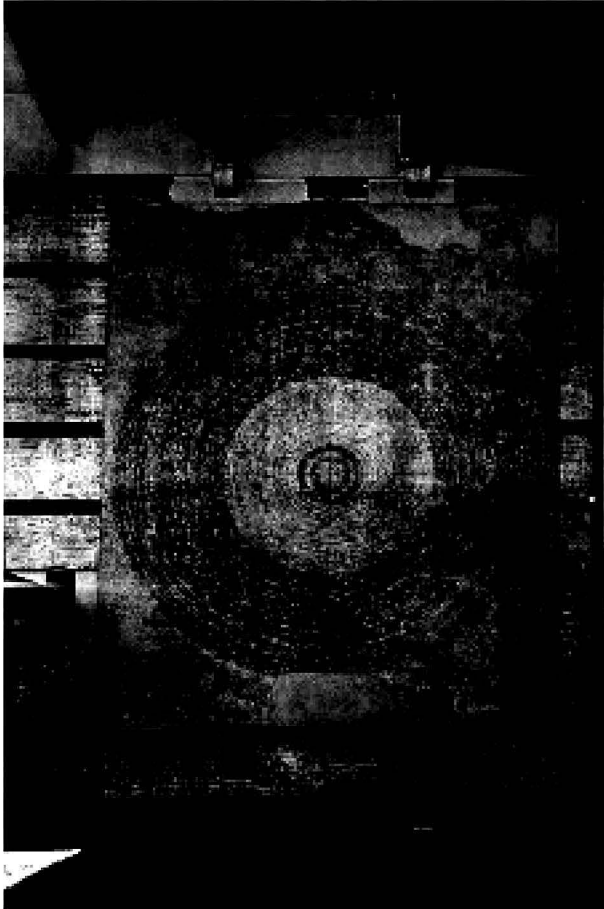
are a physical entity among other physical entities. What else could we be? In a physical world, we cannot be anything but yet another physical entity. The mind-object identity theory tells us which physical entity our experience is – the external object. However, *physicalism set the form of the conclusion long ago*. The object we are, though, is not the body, but the object that exists relative to the body. *The body brings into existence the object that the subject is identical to*.

The traditional models of perception have never been able to solve the mystery of how a thing could experience another thing. The solution I defend is that nothing can be something else. Everything is just what it is. This provides the explanation – we experience what we are identical to – *the being is the feeling*. We are identical to the objects that our bodies, which are only objects among objects, bring into existence. Our experiences are literally those objects that exist relative to our bodies. In fact, the properties of the objects we live with are exactly those properties that can take place thanks to our bodies.

Regardless of our desire to occupy a special position in nature, another fundamental reason has kept experience and world apart – the alleged cases of difference between appearance and reality, often formalized in terms of arguments about hallucination and illusion. In fact, if misperception ever occurred, there would be cases in which we experience something while there is no object.

This is where the notion of an actual object, as something that takes place at a different place and time than the effect in the body, decisively enters the theory. The notion of the actual object carves nature in such a way that experience always matches it. The object that we are does not need to be where and when the effect in our body takes place. Actually, this was impossible even for the most trivial case of everyday perception. Objects and bodies are always located in different places and times. The mystery of perception was an offshoot of placing the subject in the body. It was the wrong side of the equation. The subject is where the object was, because the subject is the object. One's experiences are the actual objects whenever and wherever they take place. Thanks to the actual object, I claim that we can tackle all cases of misperception, from hallucinations to illusions, from sensory deprivation to afterimages, from phantom limbs to phosphenes. At least, this is an empirical claim that needs to be verified on the basis of empirical evidence and not ruled out by armchair speculation alone.

I suspect that the main negative reactions to the proposed hypothesis will not be of a conceptual nature, but rather a matter of habit. It is to be expected that the possibility that the thing we are – insofar as we are our experience – is the external object will be deemed too bizarre to be true. Yet, the point is not whether a hypothesis suits our entrenched commonsensical beliefs, but whether such a hypothesis conflicts with the available evidence and whether it is logically acceptable.



**Figure 18.** A bystander looking at the Ptolemaic representation of the universe (Museum of the Cathedral, Pisa, Italy)

In the past, many notions were taken to be completely convincing – e.g., the stillness of the Earth, the fixity of the continents, the immutability of species, the existence of absolute space, the role of the luminiferous ether, and so forth. Notwithstanding the fact that such notions used to lead to all kind of issues, they were rarely questioned. I suspect that the notions that promote confusion between body and subject belong to the same group – they are beliefs that we hold to be true, despite the utter lack of evidence, by partaking in a philosophical rat pack. Like Jane Austen's narrator, we take them to be universal truths. We take them in high esteem notwithstanding the fact that they, like Grouch's club, reject us from nature. What is worse is that, to safeguard the privileged role of the mind and thus of the human brain, many scholars have introduced all kinds of mysterious conceptual

crutches – e.g., aboutness, vehicle/content distinction, intentionality, qualia, phenomenal character, and the like. They are explanatory promissory notes made to pay a bad investment (the subject/object dichotomy) that, in time, becomes a new bad investment requiring further promissory notes and debts to sustain it.

When Bertrand Russell, for a certain part of his career, expressed the view that what we experience can only be in the brain, he formalized a commonsensical view that has very rarely been questioned and is still utterly mysterious – i.e., something is closer to the subject if it was in the brain than if it was somewhere else. This assumption is completely unnecessary. Why should anything be closer to the mind only because it is closer to one's brain? Why should something be perceived because it is in the brain? The famous statement "what a physiologist sees when he looks at a brain is part of his own brain, not part of the brain he is examining" (Russell 1927, 383) does not explain why it should be any easier for the physiologist to experience his brain rather than the patient's brain. I mean, if one did not start from the assumption that one is inside one's body, why should it be obvious that one's experience is inside one's own body rather than being identical with another available object? We must be brave enough to set unnecessary assumptions aside.

Consider once more my favorite example. You watch a red apple. There are two objects – your brain and the red apple. Which of them more closely resembles your experience? The red apple. Why, then, should you be inside your body if nothing in your brain resembles your experience? When you look inside yourself, you never experience your neurons. The explanation is trivial. You are neither your neurons nor what they do. You are the external object whose existence is relative to your body and your neurons. The key is the notion of relative existence. The body is crucial because it is the object *relative to* which the external object exists. We are the other object, though, and not our body. Our body is the only object we are not.

At first, one might be bemused by the notion that one's experience is outside one's body. Does this mean that experience is out of us? No, because we are not our bodies. Nor are we located inside our bodies. In fact, the hypothesis does not contradict any evidence. In addition, it provides a more parsimonious explanation of facts. Any hypothesis – no matter how bizarre it might appear at first – that satisfies such requirement deserves to be taken seriously into consideration. As a matter of fact, there are no *a priori* reasons to locate experience inside the body. Neither does any conflict with empirical evidence arise if we do so. Experience tells us where our body is rather than where experience is. It tells us where the center of our perceptual apparatus is, but it does not tell us anything about what and where the thing we are is. However, experience tells us what experience is and thus, indirectly where experience is. Trivially, *experience is where something like experience shows up*.

If experience is real and thus physical, the nature of experience can't but tell us something about the nature of the physical world. By placing experience in nature, we will get a better understanding of nature itself.

The Galilean divide, aka the hard problem, has been introduced to justify our prejudices about the apple and the experience of the apple. Once we set aside such prejudices, the whole distinction between physical objects and mental entities crumbles down. There are just objects. Some such objects are part of what we are. An object is an object regardless of whether it is part of the bundle one's experience is. It is the same object. When an object is part of one's experience, it is not different from the object it was before. Objects exist, if they do, without being part of anyone's experience. There are no objects *and* experiences – there are only objects. Sometimes, an object is part of a bundle that is someone's experience. Sometimes, it is not. The notion of relative existence swallows both subjective and objective properties.

Consider one final case. In the still dim lit, you watch the bright screen of your phone for a while. Since you are in bed, your head presses sideways against the pillow and one of your eyes shuts. As a result, one of your eyes adapts to the bright light (becomes less sensitive) while the other eye remains in night-mode. After some reading, you put aside the phone and you walk toward the bathroom. To your surprise, one eye has become half-blind (everything looks much darker) and the other one works normally. What does it mean? The traditional explanation is that one eye sees a darker image of the world because it adapted. The mind-object identity theory's explanation is different – because of the adaptation, only a subset of the light rays is part of the object that is me. But it doesn't see darker or lighter – rather the world that is picked up has changed. With the adapted eye, you see, say, three light rays out of ten. You see those three light rays, though, as they are. However, you see only a few of the available ones. Those you see, though, are real physical lights. With the other eye you see them all.

Every change, in my experience, is either a change in the world or a change in the selection of the world that is me. Thus, if I became blind, the world would fall into darkness, because I would no longer be light.

A few years ago, David Chalmers wrote (Chalmers 1996, 5):

Ultimately one would like a theory of consciousness to do at least the following: it should give the conditions under which physical processes give rise to consciousness, and for those processes that give rise to consciousness, it should specify just what sort of experience is associated. And we would like the theory to explain how it arises, so that the emergence of consciousness seems intelligible rather than magical. In the end, we would like the theory to enable us to see consciousness as an integral part of the natural world. Currently it may be hard to

see what such a theory would be like, but without such a theory we could not be said to fully understand consciousness.

I am confident that the mind-object identity theory satisfies such requirements. For one, it answers the question about the conditions that gives rise to consciousness. Consciousness is not an addition to the physical world. There is no such a thing as a conscious apple as something different from the apple. *Being conscious of an apple is that apple being me.* And such an identity definitely shows how consciousness is integrated into nature – experience is nature. But, crucially, consciousness is not something that emerges, no more than, say, mammals emerged out of reptiles. Mammals occurred as an outcome of natural selection, variations, and inheritance. Each subject occurs as yet another object as a result of contingent causal processes. Each subject is just yet another object.

Nature is composed of actual objects scattered in time and space. Every object takes place at a certain time and location relatively to some further object. These objects compose new actual objects whenever they produce a joint effect. At any time, the current ontology of the world is open since it will be fixed by future effects. One's experience is a subset of such objects. Nature is the totality of them. Each object exists *relative to* another. One's body is an object too. Everything that happens is an object. There is no such thing as experience or appearance as opposed to nature. There are only objects.

CHAPTER 13

In a nutshell

While the implications of the mind-object identity theory are multiple and articulated in many branches, the core of the proposal is rather simple (Table 5).

Table 5. The key hypotheses underlining the mind-object identity theory

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|                              |
|------------------------------|
| $E, O, B \in \text{physis}$  |
| $E = O, E \neq B, B \neq O$  |
| $E = O \Rightarrow B$        |
| $B \therefore O$             |
| $\Delta t > 0, \Delta x > 0$ |

---

In a nutshell: the world is made only of physical entities. Experiences (E), Objects (O), and Bodies (B) are all physical entities. What is experience? Experience is identical with the Object and different from the Body (which is different from the Object). The Object causes effects in the Body and such effects bring into existence the Object, which is the Experience of the Object ( $E=O$ ).

Because of nomological constraints, between a cause and an effect there is always a non-null time span (and often some distance). Thus, any object can be any combination of objects at any spatial and temporal distance, as long as the right causal process occurs. One's world and one's experience are the same. The basic form of experience is perception, which is identical with the perceived object. There is no need for any troubling relation like intentionality because identity is enough. All forms of experience (memories, different sensor modalities, hallucinations, dreams) can be explained as perceptions of different kinds of objects – actual objects. All our experiences – world, subjects, and objects – are actual objects.



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