

ESSAY

## Brain and Consciousness: The Ghost in the Machines

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**Abstract**—This paper reviews four current theories of brain-consciousness relations—classical Cartesian Dualism, the Identity Theory, Eliminative Materialism, and a new form of Substance Dualism that includes a modified form of the Cartesian theory. This entails a critical examination of our basic concepts of what consciousness is, of the nature of the body image, and the relation of phenomenal space to physical space. This investigation reaches the same result as that attained recently by the physicist Bernard Carr (2008)—that what is needed is a paradigm shift in our basic concepts of the geometry of the Universe. In order to understand phenomenal consciousness we need to replace the present four-dimensional model with a higher-dimensional structure, in which a phenomenal space (with its contents) and physical space (with its contents) are different cross-sections (branes) of a higher-dimensional space (the bulk).

*Keywords:* brain—consciousness—mechanisms—substance dualism—brane theory

### Introduction

The scientific account of a person's consciousness and its relation to her brain that is most prominent today holds that the brain is no more than a single vastly complex electrochemical machine. The function of the brain is to discover what is going on in the physical world around the organism and to use this information to guide behavior optimally with respect to the short-term and long-term needs of the organism. The pinnacle of this information-processing and control system is held to be manifest as phenomenal consciousness—the world that a person's Self experiences—the microcosm inside the macrocosm—that is constructed by the representative mechanisms of perception that have their terminals in the brain.

The account of brain and consciousness presented in this essay extends this concept one stage further. Currently it is widely believed that the physical body (plus its brain) is the only organism that a human being possesses. However, this is not a necessary truth but only an *a priori* assumption. I suggest that phenomenal consciousness is also a highly organized and complex entity. Up to now this organization has been accounted for either by *identifying* phenomenal consciousness and its brain in various ways, or by the Cartesian denial that any such organization

exists. What is missed by this dichotomy is the possibility of a substance dualism in which a phenomenal consciousness (a person's 'consciousness module') and its brain are two ontologically independent parts of a human organism located in different but related spaces (in two of the parallel universes of brane theory), and connected by causal relations (mechanism). The Cartesian theory is a form of Substance Dualism in which one party is material and the other is not ('the ghost in the machine' or 'unextended thinking spirits'). The key difference between the two Cartesian realms is extension in space—physical matter is extended, mind is not. In this new theory (Material Dualism or Extended Materialism) both realms contain material, and both are spatial. Each is in a brane of its own, and both branes are cross-sections of a common higher-dimensional bulk. Key differences between them are the type of material contained in each (atoms *versus* phenomenal objects) and their spatial location relative to each other. There is not one machine with its attendant ghost: there are two machines. However, as we will see, it will be necessary to introduce a modified form of the Cartesian theory to complete the theory so as to explain the Self.

The traditional classical Cartesian doctrine, that humans consist of body (including its brain) and a mind, is not fashionable in Academia today. In its place we are witnessing a vigorous competition between two rival theories. One is provided by the monistic mind-brain Identity Theory of cognitive neuroscience. The other is neo-Wittgensteinian philosophy, that holds that the answers to the mind-brain problem come from analytical philosophy, and a study of ordinary language, not neuroscience (Bennett & Hacker, 2003). The present essay presents arguments that suggest that all three of these theories are mistaken.

### **What Phenomenal Consciousness Is**

There are two main senses of 'consciousness' in the current debate. The first is the medical-behavioral sense, as when the nurse says, "The patient is recovering consciousness, Doctor." This can be investigated by studying those brain states that result in coma (Smythies, "The Neurochemistry of Consciousness," in press) and by brain imaging studies that identify those neurons and brain areas (the neural correlates of consciousness, or NCCs) whose functions co-vary with various states of consciousness. The second is the phenomenal Lockean sense, in which consciousness is all that we experience—a person's own sensations, images, feelings, memories and thoughts. This can be studied by introspective methods used in psychophysics and perceptual science (as, for example, when we examine the properties and behavior of an after-image). "For example much of our visual consciousness presents itself as being extended, images and after-images having shape, size and location in the visual field, and we describe the phenomenal realm of which we are aware as a 'manifold' . . ." (Allen, 2006). Subsidiary methods study the link of consciousness to such functions as attention, as well as to how terms like 'see,' 'mind,' 'consciousness' and 'hallucination' are used (a) in ordinary speech and (b) in a psychological laboratory. This essay will focus on phenomenal consciousness.

Francis Crick (1994) provided good arguments against trying at this stage to *define* consciousness: it is better at this early stage in our enquiry to try our best to *describe* it. Schilder (1942, 1950) introduced the useful strategy of starting this task at the simplest level. So stretch yourself out on your bed in the dark and ask yourself what you can observe. Most people would say at first “Nothing.” However, further observation shows that this is not right. As Ladd (1892) reported “Ask people what they customarily see when their eyes are closed in a dark room and they will reply that they see nothing. Ask them to observe more carefully and describe what they see, and they will probably speak of a dark mass or wall before their eyes.” Schilder (1942) said, “Even with our eyes closed, black is perceived as a spatial relation.” And Wright (1981) states, “Blackness, as Locke knew well, and Lord Brain has reminded us, is a *positive state*, i.e. it is a sensory condition of the mind’s presence room [that is, the visual field].”

What more can we say about this black expanse that makes up the primitive visual field? Firstly it is limited, not limitless, in extent. It does not have a clear-cut boundary but, nevertheless, fades out at the periphery. Its shape is roughly circular—certainly not squareish, for example. Moreover, there is only one such expanse, not two, although we can easily imagine what it would be like to have two or more. Galton (1883) takes it further: “I should have emphatically declared that my field of view in the dark was essentially of a uniform black, subject to a light purple cloudiness and other small variations. Now, however, . . . I have found out that this is by no means the case, but that a kaleidoscopic change of patterns and forms is continually going on, . . .”

During the earliest stage of mescaline intoxication I have observed that these kaleidoscopic patterns are potentiated and evolve directly into the hallucinations typical of the psychedelic state. During sensory deprivation experiments, this black field can develop a much more intense black color—super-black—and can become three-dimensional. “The black curtain in front of the eyes [read ‘eyes of the body image’] gradually opens out into a three-dimensional dark, empty space in front of the body [read ‘body image’]. The phenomenon captures one’s interest immediately, and one wants to find out what comes next” (Lilly, 1956).

Schilder’s ‘primitive’ visual field can also be studied by the Ganzfeld technique. A ping-pong ball is cut into two and one-half is cupped over each eye. This results in a white and featureless visual field that is seen as a “mist of light” or a “filmy surface” separated from “me” by empty space (Cohen, 1957). This homogeneous Ganzfeld was reported to be “close at hand” or “just in front of the eyes” by all Cohen’s subjects. The modal judgment of this distance was about 2 inches.

Thus, the primitive visual field may be observed to have a number of properties.

1. There is just one visual field.
2. This has intrinsic spatial extension (two dimensional) as well as a three-dimensional distance from the observer.

3. It has spatial properties—i.e., a center, a periphery and an overall shape (roundish).
4. It is colored, with black as apparently the default color.
5. There is an observer (“me”) set back by an apparent 2 inches.

The system also has a cognitive dimension. The field does not just exist, basic or complex, but is always taken up into perception of some kind, either in everyday life, or as part of some psychological experiment. In the latter I typically observe its features and can name them—e.g., “there’s a red after-image,” “that’s a veridical percept that shows me that there is a red rose out there,” etc. Neurological lesions show that the phenomenology and the epistemology of this system are processed by different brain mechanisms. In associative agnosia the patient can see perfectly well but cannot recognize what she is seeing (De Renzi, 2000). In blindsight the patient can see nothing but can recognize (“guess” correctly) what the object ‘out there’ is, including its color. Blindsight is mediated by pathways that pass directly from the lateral geniculate body to the higher visual cortex in the left occipito-temporal area by-passing the primary visual cortex.

One must also distinguish between the Self (“me”) and what I experience. As Maund (2008) puts it, “. . . there are at least two aspects to knowing what it is like to have a certain experience. One concerns what it is like to be the *subject* of an experience; another aspect concerns the ‘phenomenal’ or ‘qualitative’ character of the experience.” I will deal with what is experienced first and then return to the Self later.

When I open my eyes in the light, the visual field changes instantly and becomes filled with organized, coherent patches of color that I take naively to be direct views of the contents of the world around me—what Crick (1994) called “the vivid picture of the world that we see in front of our eyes,” and again, “Our inner visual picture of the external world has a unity.” Broad (1923) describes the visual field as follows: “So long as it is light and one’s eyes are open, one really is directly apprehending *something*, though it is not what one uncritically takes it to be. This something is an extended, spatially continuous, variously colored and shaded field, which is presented as a finite but unbounded whole.”

This account of the visual field, as presenting a *picture* of the external world, can be thought of as incorporating the principles (but not of course the exact details) of the mechanism by which television works, and has been almost uniformly rejected by contemporary philosophers and vision scientists on the grounds that no such pictures are to be found in the brain, and because this hypothesis leads to a nasty infinite regress of little green men in the head (more on this later).

In the case of somatic sensation most people still believe that the familiar ‘body’ that they experience simply *is* the physical body composed of muscles, bones and organs. The pain of a toothache is simply in the physical tooth. As Descartes (1931) put it, “Nature also teaches me by these sensations of pain, hunger, thirst, etc. that I am not only lodged in my body like a pilot in a vessel, but that I am very

closely united to it, and so to speak, so intermingled with it that I seem to compose with it one whole.”

However, observations from clinical neurology show that this view is, in one particular, mistaken. The vessel of Descartes’ pilot is not the physical body, but it is the body image that is composed of all manner of somatic sensations: “The brain creates a body image, and pains, like all bodily sensations, are parts of the body image” (Searle, 1992). The pain of a toothache is not located in the physical tooth but in the tooth of the body image.

Most people are familiar with the fact that individuals who have had a limb amputated still report afterwards feeling the limb. Philosophers tend to dismiss this as a ‘delusion’ or an ‘illusion’—i.e., as not ‘real.’ However, it is neither. A delusion is a false belief. The person who says she experiences a phantom limb is telling the truth. She does not claim to have a real limb, which would be a delusion. She reports correctly that she has a somatic sensation. An illusion is the misperception of a real object. A phantom limb is not the misperception of a real limb since there is no real limb. A phantom limb is, rather, a hallucination. It does not represent a new order of being. A phantom limb is just the old familiar phenomenal limb that is still generated by brain mechanisms in the absence of any input from the physical limb. The neurons that generate it are located in the parietal cortex. Removal of this cortex abolishes the phantom. Phantom limbs can often be moved either voluntarily or involuntarily, as when the limb extends automatically to ‘catch’ a ball thrown at the person. As for reality, the pain in a phantom limb is at times real enough to drive the patient to suicide. Nor is a phantom limb some kind of learned phenomenon, for people with congenital absence of limbs can report phantoms (Ramachandran & Blakeslee, 1998).

Nida-Rümelin (2008) gives a good example of the confusion of the body image and the physical body. “We see the [colors] *outside* there on the thing perceived . . . when reflecting on the phenomenal character of our own experience we are not looking *inside*. We are not perceiving what is going on in our brain or looking into some inner space” (pp. 314–315). On the contrary, phenomenal colors are only located *outside relative to the body image*, and not *outside relative to the physical body*. A phenomenal color is a part of my visual field, which the evidence suggests, in my opinion, is a part of my own organism.

However, to avoid philosophical confusion, it is better not to say that we *perceive* what is going on in our brains, or in our private phenomenal spaces, since, by definition, we should say that we perceive only external objects. Sensations are only a part of the process of perception, but we do not perceive sensations. Psychologists, during the course of their experiments, can examine or observe (but not perceive) their own sensations, veridical or hallucinatory, but that is for different purposes. We do not say that we perceive what is going on in our brains, not for the reason Nida-Rümelin gives, but because we cannot confuse a part of a process with the whole process. Having sensations is the last step in the complex representative chain of perception. Perceiving external physical objects involves the whole chain.

### Vision and Television

The current scientific account of how vision and visual consciousness works extends from retina to cortex. A great deal is known about how the information delivered on the retina is transposed by numerous serial and parallel neurocomputations at all levels into the activation of specific patterns of neuronal activity in the visual brain. In a recent review Mesulam (1998) says that brain mechanisms help to create a highly edited subjective version of the world. The question then remains—what is the relation between this “highly edited subjective version of the world” in the brain and the ever-changing contents of a phenomenal consciousness? As Grossberg (1987) says, “When we gaze upon a scene, our brains combine many types of locally ambiguous visual information to rapidly generate a globally unambiguous representation of form-in-color-in-depths . . . how do . . . multiple sources of visual information preattentively cooperate to create a three-dimensional form?”

The visual field presents in some sense the end result of all these neurocomputations. But how does the system convert the buzzing activity of billions of neurons into Crick’s “our vivid internal picture of the external world”? When I examine my visual field I can see Crick’s point. I can readily understand the claim that it is a picture of the world and a televisual picture at that. A ‘television’ theory of perception is any theory that states that the visual field in consciousness is constructed by some form of representative mechanism. An ordinary television picture is built up by a specific mechanism—a raster in the case of older analog systems, and pixels in the case of digital television. If I examine my visual field I can detect no signs of grain betraying a raster or a pixel system, but I can easily imagine what it would be like to do so. In the case of a digital system there would be small dots in my visual field: in the case of an analog system there would be thin lines. Therefore, if there is such a system, it must be extraordinarily fine grained. That is not impossible, yet many people claim that there are insuperable difficulties to a televisual theory of visual perception. I will therefore review these difficulties.

### The Missing Pixels

One criticism of any television theory of visual perception and phenomenal consciousness is that it says that vision ends in a series of television images, yet, when one looks into the brain, there are no such images to be found. The conclusion usually drawn is that no such images exist. Therefore we should throw the TV theory out. However, there is another conclusion that may be drawn, and that is that these TV images are not in the brain but in the mind. This theory may be put as follows. The key points are (1) phenomenal space and physical space are not different aspects of the same space, but are different spaces, or different subsections of a common higher-dimensional space. “. . . there is equal motivation to distinguish subjective or phenomenal space from that invoked in our physical descriptions of the world” (Allen, 2006). “All this [the physiological account of

perception] has a consequence that has not been adequately recognized, namely that the space in which the physical table is located must be different from the space we know by experience” (Russell, 1948). (2) Phenomenal space is not an empty abstract space, but has real contents, e.g., the body image and ‘phenomenal visual scenes’ that a neurologist would call visual sensations. (3) Phenomenal consciousness is the final step of a TV mechanism (as defined above). (4) The human organism (physical body + a consciousness module) is distributed in both realms. (5) There are two types of real matter in the cosmos—physical stuff (e.g., atoms, brains, stars) located in one space, and mind stuff (sensations, images and thoughts) located in another space. Both generate equally real events that interact causally in both directions. This point requires further elaboration. One could say that minds are entities made of mind stuff and that experienced sensations, images, thoughts, and feelings would then be states, processes or functions of the substantial mental system. Alternatively one could say that sensations, images, thoughts and feelings are different kinds of mind stuff and that their coexistence in a consciousness module makes up a substantial mind. These could perhaps be combined with the statement that we are dealing here with a *whole*—a consciousness module—made up of a number of different *parts*—sensations, images, thoughts and feelings. We then have to ask, as the various modalities of sensations, images, feelings and thoughts appear to be somewhat different from each other, what are the attributes that (a) put them in the same class and (b) how can these attributes be varied so that a visual sensation can be differentiated from an auditory one and both from a feeling or a thought? To this we could answer that the attribute (a) they all share is to be located in the same consciousness module (and not in the physical world) and to belong to the same Self. Other collections of these items, of course, will be located in other consciousness modules and will belong to a different Self. The attributes (b) that enable us to differentiate them are firstly their obvious qualitative differences (think of a bright red visual after-image and a deep humming sound) and, in addition (i) that sensations are the terminal happenings (parts, events, structures) of a representative mechanism (which thoughts, feelings and images are not); (ii) that visual and somatic sensations are spatially extended, whereas thoughts and feelings are not; and (iii) the Self owns all the others, whereas none of them owns the Self (more on the Self later).

Another important question needs to be addressed. The theory suggests that each person has his or her own unique consciousness module embedded in a brane. So do all consciousness modules float around, as it were, in one common brane? Or does each consciousness module have a brane all to itself? If we cut a number of planes out of a cube we can confine our cuts to the cube, like cutting slices of toast out of a loaf of bread. Or we can add extra dimensions for each slice, thus enlarging the cube dimensionally to a tesseract and successively beyond. In this second model the Universe has vastly more spatial dimensions than it does in the first. There is no means of telling which is correct. This is an empirical matter, at present beyond our reach. A Flatlander can have her physical

body in plane A and her consciousness module in a second plane B that intersects A. A second Flatlander, with his body in A, can have his consciousness module in B, or in a third plane C, that also intersects A, and so on for any number of Flatlanders through D to  $n$ .

Then it might be asked, if sensations, images, feelings and thoughts turn out to be some type of material entities located in a space of their own outside physical space, what becomes of the concept of 'mind'? To this one can reply that none of the discussion presented so far applies to Ryle's (1949) dispositional concept of the nature of mind, which is logically different from the phenomenal sense of 'mind' used in this essay that describes the structures and events that can be observed by introspection, and the entity—the Self—that is doing the observing. A suitable machine (organism, super-computer) can be dispositionally intelligent, diligent, tenacious, deceitful, etc., no matter what it is made of; whereas phenomenal consciousness requires a particular structure in line with what we can introspectively observe.

The theory of extended materialism was first formulated by the great chemist Joseph Priestly in 1777. He first points out that the concept of the soul, or mind, as an immaterial substance was, in 1777, a novel idea introduced by Descartes. Before him, and to this day in Hindu philosophy, a dualist mind or soul was thought of as an "attenuated aerial substance" made of so fine a material as to be undetectable by the senses. Priestly continues, using Locke's concept of 'idea':

The vulgar who consider *spirit* as a *thin, aerial substance* would be exceedingly puzzled if they were to endeavour to realize the modern idea of a *proper immaterial being*, since to them it would seem to have nothing *positive* in its nature, but only a *negation of properties*, although disguised under the positive appellation of *spirit*. To them it must appear to be the idea of *nothing at all*, and to be incapable of supporting any properties. It will not be denied but that sensations or ideas properly exist *in the soul*, because it could not otherwise retain them. . . . Now whatever ideas are in themselves, they are evidently produced by external objects, and must therefore correspond to them; and since many of the objects or archetypes of ideas are divisible, it necessarily follows, that the ideas are divisible also . . . and how is it possible that a thing (be the nature of it be as it may) that is *divisible*, should be contained in a substance, be the nature of it likewise be what it may, that is *indivisible*.

If the archetypes of ideas have extension, the ideas expressive of them, and actually produced by them, according to certain mechanical laws, must have extension likewise; and therefore the mind in which they exist, whether it be material or immaterial, must have extension also. But how anything could have extension, and yet be immaterial, without coinciding with our idea of mere empty *space*, I know not. I am therefore bound to conclude, that the sentient principle in man, containing ideas which certainly have parts [is] not the simple, indivisible, and immaterial substance that some have imagined it to be; but something that has real *extension* and therefore may have the other properties of matter.

Thus Priestly presents the first formulation of a robust material dualism in which the mind (phenomenal consciousness) is postulated to be composed of a type of matter extended in a space of its own. As he says "The mind . . . is not immaterial substance . . . but is something that has real extension and therefore may have the other properties of matter."

The next stage in the development of this type of material dualism was taken by C. D. Broad (1923), who enquired into the nature of the space in which sensations (*sensa*) may be extended.

For reasons already stated, it is impossible that *sensa* should literally occupy places in scientific space, though it may not, of course, be impossible to construct a space-like whole of more than three dimensions, in which *sensa* of all kinds, and scientific objects literally have places. If so, I suppose, that scientific space would be one kind of section of such a quasi-space, and e.g. a visual field would be another kind of section of the same quasi-space. (pp. 392–393)

Putting Priestly's and Broad's suggestions together we get a picture of a phenomenal consciousness as a spatially extended and material entity located outside the brain in a space of its own that is one cross-section of a higher-dimensional space, of which another cross-section encompasses the physical world. The next step was contributed by H. H. Price (1953), who saw that these two entities must be connected by a new type of causal relation that connects events in parallel universes. Further details of this new theory were supplied by Smythies (1956). The concept that phenomenal space and physical space are ontologically different spaces has also been expressed by Ayer (1940), Russell (1948), Moore (1971) and Carr (2008) (and see Smythies, 1994: 149–150, for details).

This new theory takes care of the 'pictures in the brain' problem. The pictures that fill a person's visual field are, the theory suggests, located outside her brain in her consciousness module. They are constructed by a TV-like mechanism. Part of this mechanism (that functions like the computer inside a digital TV system) is located in her brain. The other part consists of the TV screen itself (her visual field), plus a connecting mechanism. This abstracts the information from the brain and throws it onto the visual field (more on this below). A similar process operates in the case of her other senses. So we no longer have to worry about how mechanisms as different as nerve nets in the brain and sensory fields in consciousness could, in some sense, be identical. Experimental evidence, fatal to naïve realism, that the brain employs information compression technology and virtual reality mechanisms, as does TV, has been reviewed elsewhere (Smythies, "Philosophy, Perception and Neuroscience," in press).

### **The Little Green Man**

This account has been criticized by some (e.g., Crick, 1994; Descartes, 1931; Ryle, 1949) on the grounds that talking of internal pictures in this way leads to the infamous 'homunculus' and an infinite regress of little green men in heads. The argument runs as follows: We cannot allow for vision to include internal pictures, because, if we do, we have to ask what inside the person is looking at these pictures, and, as Crick (1994: 24) pithily put it, "trying hard to understand what is going on." This means that we have to posit a little green man inside our heads, and inside that little green man's head, there must be another little green man, and so on.

However, as Fodor (1981) pointed out, this argument is invalid. He says that the fact that seeing an object requires an image in our minds does not in the least entail that experiencing the resulting image requires the same mechanism (i.e., another picture in the observing Self). The two processes are essentially different. The mechanistic process that connects the retina to the visual field (i.e., extremely sophisticated television) is quite distinct from the ostensively-indicated interaction between a Self and its visual field.

As I have not yet discussed the Self, this, I feel, is the point to do so. This will require us to reintroduce a modified form of Cartesian Dualism into the theory. Some philosophers (e.g., Berkeley) believe in the existence of the Self. As he said (1949), “How often must I repeat, that I know or am conscious of my own being; and that myself am not my ideas, but somewhat else, a thinking active principle that perceives, knows, wills and operates about ideas. I know that . . . I am therefore one individual principle, distinct from color and sound; and, for the same reason, free from all other sensible things and inert ideas.”

Others do not believe in the existence of the Self. Here I side with Descartes and Berkeley. Logically there cannot be experiences without the existence of a subject they are the experiences of. However, the Self is not located in the head of the physical body—like a pilot in a vessel—as Descartes put it. It is rather located in the head of the body-image, which is itself a mental entity.

Verbal definitions of the Self are hard to achieve. So, perhaps, an ostensive definition is better. In this you tell a person to concentrate on, e.g., an after-image and tell you its color and shape—which she will easily be able to do. Then you can ask, during this exercise, whether she noticed that there was more than just an after-image involved: surely there was also her “me” doing the examining, and such a Self is not extended in space. Likewise, in a dream there is not just a collection of dream images; there is also a dream Self wandering around in the dream world experiencing all that is going on therein.

So a complete account of a consciousness module describes a complex structure with some spatially extended parts (visual and somatic sensations and images) plus some unextended parts (thoughts and the Self).

### **Further Advantages of Material Dualism**

These further advantages of Material Dualism may be highlighted by comparing it with the competition.

(i) The Identity Theory (IT) states that phenomenal entities (events) are identical with certain neural entities (events). As we have seen earlier, phenomenal entities have observable properties of color, shape and movement. Their NCCs also have properties in the same categories. These specifications of each property are different in each case. Thus, IT runs afoul of Leibniz’s Law of the Identity of Indiscernibles, which states that identical entities must have identical properties. NCCs certainly carry the same information about what’s “out there” as do sensations, but they are in different forms. The visual cortex has a topographical

code (over 30 individual maps) plus a vectorial code. The visual field has only one topographic code and no vectorial code. How could they be identical? Besides, it is hard to accept the proposal that a familiar phenomenal object is really just electrochemical activity in a collection of neurons. It *looks* like an image on a TV screen, not a mass of neurons. Identity theorists may hold on to their theory in the laboratory but, in everyday life, they are naïve realists like everyone else.

The theory of Material Dualism does not have this problem. In that theory the only thing that neurons do is to generate complex patterns of electro-chemical activity (Smythies, 2002) that co-vary with the sensory input, perform computations on that input modulated by memory (see below) and generate behavior. There is no need to invent tortuous reasons whereby they are identical with phenomenal objects, or with any ‘act of perception.’ Internally they simply do their own thing. Externally the new theory postulates that they bear causal relations with the contents of phenomenal consciousness.

The theory presented here is essentially the same as that presented by Carr (2008). It differs from that published by Paul Marshall (2005), who is concerned with the nature of the higher reality experienced by mystics. He supports a Leibnizian panpsychic idealism. In contrast, the theory that Carr and I support is a realist theory. Nevertheless, it can explain the facts discovered by parapsychologists (as Carr details) and it can present a plausible account of the place of a human soul in ‘next world’ along lines similar to those that Price (1953) proposed.

(ii) Eliminative Materialism (EM) ‘solves’ the problem of the relation of phenomenal objects and their NNCs by denying the existence of the former. We are asked to believe that Crick’s “vivid internal picture of the world” does not exist and that we are merely suffering from delusions when we claim that it does. EM theorists equate phenomenal objects with things like phlogiston and the luminiferous ether, that do not exist either. However, these do not provide good models. We experience phenomenal objects, but not phlogiston and the ether: “Churchland’s systematic denials of qualia are transparent fallacies of ambiguity” (Crooks, 2008).

The lack of plausibility of EM can further be demonstrated as follows. The theory says we have no experience of phenomenal objects, yet we see perfectly well. However, there are people who really do not experience phenomenal objects. They suffer from cortical blindness due to occipital lobe damage. There are other people who can identify external objects, but cannot see them. They are the patients with blindsight. So a critic of EM can claim that what EM theorists are claiming to be normal perception is what in fact would happen in the case of a patient with occipital lobe damage and 100% accurate blindsight. Since no one would claim that such a patient has normal vision, it would seem that EM runs into difficulties.

Sherlock Holmes once said that, when trying to solve any problem, one must first eliminate the impossible: then, whatever is left, no matter how improbable,

must be the truth. I suggest that Naïve Realism, the Identity Theory and Eliminative Materialism are all impossible theories for the reasons reviewed above. But, however startling it may appear to ‘common sense,’ material dualism is not. It contains no impossible elements.

- (i) The concept that the Universe may be composed of parallel universes is already part of brane theory in modern physics (Carr, 2008).
- (ii) Brane theorists at present have only thought of the contents of any universe(s) parallel to our own physical universe as being composed of similar material (quarks, etc.). However, a parallel universe could contain anything, including sensations and the postulated TV-like mechanism that transduces brain states to sensations. This mechanism, if such exists, must contain two parts. If we consider only vision, there is (i) the part that actually constitutes the visual field carrying its picture of the external world. This corresponds to the screen of a TV set in that model. But a TV-like mechanism cannot consist of just a screen, there must be (ii) a mechanism behind the screen that extracts the requisite information from the visual cortex and delivers it to the screen. This it could easily do, as every point in the brain is immediately in contact with the higher-dimensional space surrounding it—just as every point in a plane is in immediate contact with the cube of which the plane is a cross-section. We cannot observe this mechanism by introspection for the same reason that we cannot look through the screen of a TV set into the works behind. And we cannot see it by vision, as it lies in a parallel universe outside the range of light cones in our physical space. It should be noted, however, that parallel universes are parallel because of their location in space, not because they are in causal isolation from each other (Price, 1953).
- (iii) Physics at present only considers causal relations between entities in one four-dimensional (4D) universe, and uses only 4D vectors for that purpose. However, there could logically be causal relations between events in parallel universes (Price, 1953). All that is required are five (or greater than five) dimensional (D) vectors. An ordinary vector is a directional line joining two points in a 3 space (or a 4 space-time). To obtain a 5D vector, take two 4D cross-sections (A and B) of a 5 space. Then a directional line joining any point in A to any point in B would be a 5D vector (Smythies, 1994).
- (iv) The theory is open to experimental test (see Smythies, 1994, for details).
- (v) The really startling feature (for stolid ‘common sense’) of material dualism is the already-established fact that we do not experience our own physical bodies at all. I have become so accustomed to the idea that my oh-so-familiar ‘body,’ that I feel wrapped around me, as it were, every moment of every waking day—Descartes’ vessel in which the pilot is so snugly ensconced—simply *is* my body that it comes as a severe shock to

realize that it is not my physical body at all, but rather an image of my body constructed by my brain. Once one has gotten over that hurdle, the rest is easy.

### Conclusion

Allen (2006) has suggested that, in order to understand consciousness and its relation to the brain, it may be necessary to engineer a paradigm shift in our concepts of space and time. Penrose (1989: 144) stated “It is my opinion that our present pictures of reality, particularly in relation to the nature of time, is due for a grand shakeup—even greater, perhaps than that which has already been provided by present-day relativity and quantum mechanics.” Carr (2008) and I suggest that such a player is already on the stage. The fact that this player has taken so long to appear may be traced in part to the fact that higher-dimensional geometry was not available to Joseph Priestly in 1777.

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