The Origin of Consciousness

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Abstract

The existence of human consciousness has received a great deal of attention within the scientific community. There are some who deny its existence altogether. There are those who believe it is nothing more than the result of physical properties within the brain. And there are some who contend it exists separate and apart from the brain. Many of these theories have been shaped by the desire of evolutionists to explain human consciousness via a purely materialistic/mechanistic bent. In this paper, we provide a historical background to the conflict, and examine the two broad categories—monism and dualism—that are used in an attempt to explain human consciousness. We also discuss many of their subcategories, to see how each fares in light of the available facts. Increasingly, experimental data document the fact that human consciousness is separate and distinct from the mere physical matter of the brain. This understanding indicates that there is, then, a non-material aspect of human beings that must be accounted for.

[Note: In this paper, SMALL CAPS indicate emphasis in original; *italics* indicate emphasis added.]

Theories of the Origin of Human Consciousness

In his 1997–1998 Gifford Lectures at the University of Edinburgh, Holmes Rolston said to his audience: "Humans do seem to be an exceptional species" (1999, p. 164). Indeed we are. And one of the things that makes us "exceptional" is the reality of our self-consciousness. Evolutionists acknowledge, to use Michael Ruse's words, that "consciousness is a real thing" (2001, p. 200). Adam Zeman, in commenting on the fact that human self-awareness is intuitive, discussed just how "real" it is.

> The first intuition is that consciousness is a robust phenomenon which deserves to be explained rather than being explained away. Sensory experiences like those of colour, sound or pain, the simplest and most vivid instances of consciousness, are phenomena which any full description of the world must reckon with…. The second intuition is that consciousness is bound up with our physical being…. The third intuition is that *consciousness makes a difference*. It seems self-evident that much of our behaviour is explained by mental events; if we could not see or hear or touch, if we could not experience pain or pleasure, if we lacked conscious desires and intentions, we would not and could not behave as we do (2001, p. 1282).

But consciousness is more than merely "a real thing." It is *important*—because "*it makes a difference!*" Stephen Jay Gould called it the "most god-awfully potent evolutionary invention ever developed (1997, p. ix)." Johanson and Edgar somewhat blushingly observed that it "adds layers of richness to our lives" (1996, p. 107). Laszlo referred to it as "perhaps the most remarkable of all the phenomena of the lived and experienced world" (1987, p. 116).

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Such comments provide powerful testimony to the ultimate importance of human consciousness. Robert Jahn and Brenda Dunne commented on the significance of the role of consciousness:

> In our age, however, as science and its derivative technologies press forward into increasingly abstract and probabilistic domains of quantum and relativistic mechanics, *the role of spirit or consciousness*—whether divine or human, individual or collective—in the structure and operation of the physical world inescapably returns to more pragmatic and theoretical relevance, and *can no longer casually be set aside if the goal is a truly comprehensive understanding of nature* (1994, p. 157).

What Popper and Eccles unhesitatingly called "the greatest of miracles—the emergence of full consciousness," *must somehow be explained* (Popper and Eccles, 1977, p. 129). Even though, as George Wald admitted, "the problem of consciousness tends to embarrass biologists" (1994, p. 129), it nevertheless finally seems to be getting its fair due in "polite discourse." Eccles himself commented: "…[T]here are now signs that the conscious self or psyche can be referred to in 'polite' scientific discourse without evoking an outrage verging on obscenity!" (1992, p. 234).

Let us, then, enter into a "polite scientific discourse" about the conscious self. Note that, as Eccles and Robinson said about humans, "we are not 'basically' or 'fundamentally or 'at root' zygotes; we are *persons*, the most extraordinary production of all" (1984, p. 51). Admitting that fact has serious implications. They continued:

> There is in all of this a chilling neglect of what can only be called a moral point of view…. What is the moral point of view, and how is it related to human happiness?… Without being specific at this point, we may say that *the moral point of view begins with man's awareness of the fact of his own transcendence; the recognition that human persons are different from and rise above those utterly material events comprised in the purely physical cosmos.*
>
> Even if a citizen has had special training in science, he is still conditioned in his daily perceptions by a pervasive METAPHYSICS that imposes a definite character on the full range of cognitive, emotional, social, and aesthetic processes—*the processes that are brought to bear on the serious matter of life* (pp. vii,viii).

Human persons undeniably "are different from, and rise above those utterly material events comprised in the purely material cosmos." Dobzhansky and his co-authors freely admitted: "Without doubt, the human mind sets our species apart from nonhuman animals" (1977, p. 453). Yes, it does—far apart! The question is: *Why?* How does the General Theory of Evolution account for the origin of the emergence of full consciousness—"the greatest of miracles"? It is our intent to answer that question. We review and discuss a veritable plethora of theories that have been proposed in what we believe are failed attempts to explain the origin of human consciousness.

The "Hard Problem" of Human Consciousness

Let us point out that not everyone within the evolutionary community believes that consciousness *can* be explained. That is the position that David Chalmers has taken. E.O. Wilson wrote concerning Chalmers' views:

> The Australian philosopher David Chalmers recently put the matter in perspective by contrasting the "easy problems" of general consciousness with the "hard problem" of subjective experience…. The hard problem is more elusive: how physical processes in the brain addressed in the easy problems give rise to subjective feeling. What exactly does it mean when we say we *experience* a color such as red or blue? Or experience, in Chalmers' words, "the ineffable sound of a distant oboe, the agony of an intense pain, the sparkle of happiness or the meditative quality of a moment lost in thought?… It is these phenomena that compose the real mystery of the mind" (1998, pp. 115–116).

This "hard problem" may be, in fact, *so* hard that it is unsolvable. As Griffin noted:

> The lack of definitive evidence revealing just what neural processes produce consciousness has led Chalmers (1996) to designate the question of how brains produce subjective awareness as the "hard problem." *He and others claim that it is such a difficult problem that normal scientific investigation is unable, in principle, to solve it,* and that consciousness must be something basically distinct from the rest of the physical universe (2001, p. 13).

In short, Chalmers' philosophical resolution of this "hard problem" is to offer a new way of thinking, which he calls *naturalistic dualism*. In essence, this is the idea that there exists both a physical realm with its own set of well-established laws, and a "consciousness" realm with its own set of "psychophysical" laws—laws, by the way, that have yet to be discovered (see Wyller, 1996, p. 218). Thus, when it comes to explaining human consciousness, science is impotent—at least for the time being. Alwyn Scott remarked:

> In the last few decades, however, science has made some progress in gathering objective information about a phenomenon that is thought by many to be ineffable. Once off limits to serious researchers, consciousness is again becoming an acceptable subject of scientific inquiry…. *Yet here, as with the efforts of ancient sages, no comprehensive*

> *understanding of consciousness has arisen from the scientific Balkanization of the subject…. Consciousness cannot, alas, be reduced to the response to an inkblot or the activity of a set of neurons* (1995, pp. 1–2).

"Failure Is Not an Option"

Darwinians realize that evolution is not "just" a theory, but also a cosmogony—i.e., an entire world view. Dobzhansky acknowledged as much when he wrote:

> Evolution comprises all the states of development of the universe; the cosmic, biological, and human or cultural developments. Attempts to restrict the concept of evolution to biology are gratuitous. Life is a product of the evolution of inorganic matter, and man is a product of the evolution of life (1967, p. 409).

Because evolution is so pervasive, whatever is *here* must be explained by evolution; there can be no exceptions—not even human self-awareness. James Trefil conceded this point:

> No matter how my brain works, no matter how much interplay there is between my brain and my body, one single fact remains. For whatever reason, by whatever process, I am aware of a self that looks out at the world from somewhere inside my skull. I would suggest to you that this is not simply an observation, but the central datum with which every theory of consciousness has to grapple. *In the end, the theory has to explain how to go from a collection of firing neurons to this essential perception* (1997, p. 181).

Not explaining consciousness is *not* an option. And so, evolutionists have no choice but to "buckle down," "put their collective noses to the grindstone," "burn the midnight oil," and devise an explanation for the origin of consciousness. Even though, to use Bryan Appleyard's summary of the problem, "hard, deterministic science's view of man is that he is a curious accident" and that "self-consciousness is a problem," it is "not of a different order from other problems…" (1992, p. 191). Yes, it is a problem. And it is a serious problem of considerable magnitude. But we will figure it out. To use Trefil's words, even though consciousness is produced by "mechanisms we still haven't worked out, *we will do so!*" (1996, p, 218).

Theories of Human Consciousness

Speaking in broad strokes, there are two main approaches to what most scientists and philosophers refer to as the "mind-body problem." Gordon Taylor assessed them as follows:

> They are known as the *dualist* and *monist*, terms I shall not be able to avoid using. Dualists maintain that the brain and the mind are two distinct beings; monists assert that they are only one thing seen from two different angles, so to speak….. None of these views, I may as well warn you, stands up to inspection (1979, pp. 20–21).

We will review these two broad groups, and their subdivisions, in some detail. Then, as we bring this discussion on consciousness to a close, we offer a third alternative that *does* "stand up to inspection."

Dualism

The concept known as *dualism* is attributed to the seventeenth-century French physician/mathematician/philosopher René Descartes, who probably is most famous for his well-known statement, "I think, therefore I am." Interestingly, however, the idea for dualism did not originate with Descartes (although he is the one who generally receives credit for it). Earlier, Augustine, in his *City of God*, had written:

> Without any delusive representation of images and phantasms, I am most certain that I am, and that I know and delight in this. In respect of these truths, I am not afraid of the arguments of the Academicians, who say, "What if you are deceived?" For if I am deceived, I am. For he who is not, cannot be deceived; and if I am deceived, by this same token I am (see Custance, 1980, p. 28).

In the end, however, it was Descartes who "resolved to take myself as an object of study and to employ all the powers of my mind in choosing the paths I should follow" (as quoted in Fincher, 1984, p. 16). The paths Descartes chose eventually designated him as the father of the mind/body theory of *interactionism*. In his book, *Discourse on Method and the Meditations* (1642), Descartes suggested that the mind was every bit as real as matter, yet was entirely separate from matter—and therefore from the brain as well. In Descartes' language, the mind was *res cogitans* (thinking substances), as opposed to the brain, which was *res extensa* (material or physical substances). Descartes even thought he had located the "seat" of consciousness in the brain—the pineal gland. Wyller summarized Descartes' views as follows:

> René Descartes is generally considered to be the originator of the modern mind-body problem…. He believed that mind states and physical states are mutually interactive—through the pineal gland in the brain. Thus arose the Cartesian mind-body dualism that still influences modern scientific thinking in this field (1996, p. 213).

It is something of a mild understatement to suggest that dualism "still influences modern scientific thinking in this field." Gilbert Ryle referred to dualism as "the official doctrine" (1949, p. 11). In commenting on that phrase,

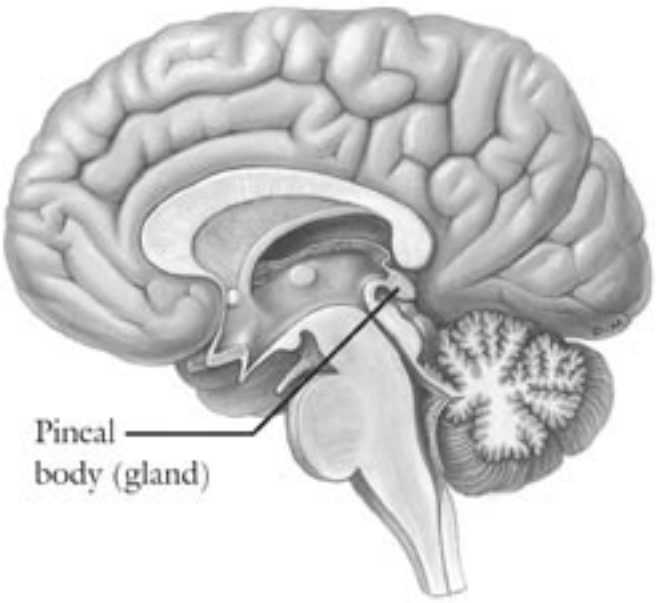

Figure 1. Descartes believed the seat of consciousness was located in the pineal gland. LifeART image copyright (2003) Lippincott Williams & Wilkins. All rights reserved.

Paul Davies asked:

> What are the features of the dualistic theory of the mind? The "official doctrine" goes something like this. The human being consists of two distinct, separate kinds of thing: the body and the soul, or mind. The body acts as a sort of host or receptacle for the mind, or perhaps even as a prison from which liberation may be sought through spiritual advancement or death…. However, the mind (or soul) is not located inside the brain, or any other part of the body; or indeed anywhere in space at all…. An important feature of this picture is that the mind is a thing; perhaps even more specifically, a substance. Not a physical substance, but a tenuous, elusive, aetherial sort of substance… (1983, p. 79).

Trefil summed it up like this:

> One way of looking at this question (which is almost certainly wrong) is to imagine that somewhere in the brain is an "I" who is watching the final products of the processing of signals by neurons. The essence of this view is that there is something in "mind" that transcends (or at least is distinct from) the workings of the physical brain. The seventeenth-century French philosopher and mathematician René Descartes advocated such a view of mind/body dualism, so the hypothetical place where mental images are viewed is often referred to as the "Cartesian Theater" (1996, pp. 217–218).

The book, N*obel Prize Conversations*, includes the text of a series of "conversations" that occurred in November 1982, at the Isthmus Institute in Dallas, Texas, among four Nobel laureates: Sir John Eccles, Ilya Prigogine, Roger Sperry, and Brian Josephson. Norman Cousins was the moderator for those conversations. After listening to Drs. Eccles and Sperry discuss their research, documenting that the mind exerts a significant influence on the brain, Cousins was constrained to say that when we see evidence such as that produced by the scientific research of Nobel laureates like Sperry and Eccles

> …that mind is in charge of brain, we spontaneously recognize their conviction as something we've always known or at least suspected. What grips us as we listen to these men is not only the elegance of their demonstrations, nor the sheerly rational force of their arguments, but their everydayness…. *We find ourselves agreeing with Sperry and Eccles because what they say seems "right"* (1985, pp. 39–40).

Perhaps that explains, at least in part, why, as Trefil went on to note, that "[t]his so-called mind-body dualism has played a major role in thinking about mental activity ever since Descartes" (1997, p. 181).

But that is not all that Dr. Trefil had to say. He also commented: "Philosophers have, in fact, written long and detailed critiques of the Cartesian approach to the world" (1997, p. 181). Later, we will return to the idea behind Trefil's comment that "there is a sense in which something like Descartes' procedure remains valid for the question of human consciousness," because he is absolutely right in such an assessment. For now, however, we concentrate on his statement that "philosophers have, in fact, written long and detailed critiques of the Cartes ian approach to the world."

Indeed they have, as well as their counterparts in the scientific community. In his exhaustive review on "consciousness," Zeman remarked that "there is a deep dissatisfaction with the Cartesian separation of body and mind" (2001, p. 1264). But, as E.D. Adrian admitted: "…[A]greement in rejecting dualism has not been coupled with agreement in accepting anything else" (1965, p. 239). The question, then, is *why* is there such a "deep dissatisfaction"?

Simply put, there is "deep satisfaction" with the Cartesian view that body and mind are separate because: (a) such a concept is deemed "unscientific"; (b) it does not "square" with evolutionary concepts; and (c) still worse (at least in the eyes of many), it has "theological overtones." Arthur C. Custance addressed these matters as follows:

> Most of the important thinkers who followed Descartes rejected interactionism. It was not a testable hypothesis. *Above all, it introduced the supernatural into the picture and thus removed the concept from the scientific laboratory into the theological seminary*…. What emerged was

> a determination to reduce everything to physics and chemistry, or perhaps more precisely to physics and mathematics… (1980, p. 31).

Kirtley Mather was more blunt when he wrote in *The Permissive Universe*:

> I know of no scientifically verifiable data that would support the idea that the human soul is a separate entity inserted from above or without into the human body and residing therein during a person's lifetime…. Equating thus the human soul with the spiritual aspects of the life of man, it follows that *the soul, like the body or the mind, is a product of evolutionary processes*… (1986, p. 174).

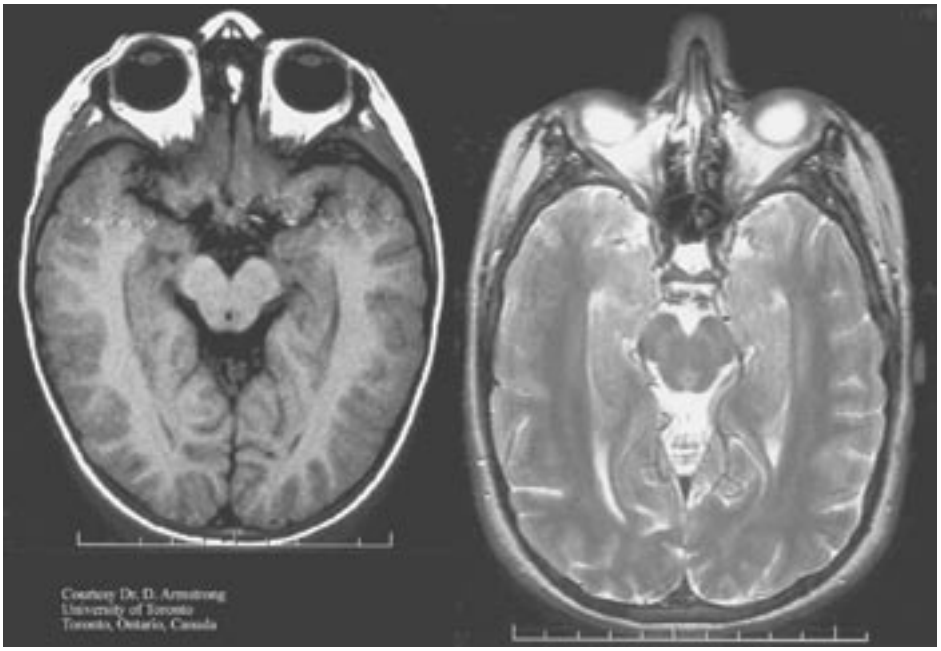

Figure 2. Is there a "Ghost in the Machine?" LifeART image copyright (2003) Lippincott Williams & Wilkins. All rights reserved.

As Sperry noted:

> [A] central requirement imposed by science would seem to be a relinquishment of dualist concepts in conformance with the explanation of mind in monist-mentalist terms. Such a shift from various dualistic, otherworldly beliefs to a monistic, this-world faith, would mean that our planet should no longer be conceived, or treated, as merely a way-station to something better beyond. This present world and life would thus in each case, acquire an added relative value and meaning (1985, pp. 159–160).

Or, to use Mather's words: "The conclusion is inescapable. Mankind's destiny is that of an earth-bound creature. Salvation must be sought here on this terrestrial planet" (1986, p. 157). Zeman concluded:

> The suggestion that conscious events are identical with the corresponding neural events offers a reductionist and materialist, or physicalist, solution to the mind-body problem…. *Why should consciousness be an exception to the stream of successful reductions of phenomena once considered to be beyond the reach of science?* (2001, 1282).

Philosopher Gilbert Ryle, played a critical role in what many today view as the final debunking of Cartesian dualism. Ryle stated clearly that his goal was to expunge once and for all the "official doctrine" of what he called "the dogma of the ghost in the machine" (pp. 15–16). The *Encyclopaedia Britannica*, in its assessment of Descartes, offered the following commentary.

> The strongest 20th-century attack on Cartesian dualism was launched by the British analytic philosopher Gilbert Ryle in *The Concept of Mind* (1949), where he exposes what he describes as the fallacy of the ghost in the machine. He argues that the mind—the ghost—is simply the intelligent behaviour of the body…. *His position, like that of the Australian philosopher J.J.C. Smart, is ultimately materialist: The mind is the brain.* The American pragmatist Richard Rorty…*says that philosophy in the Cartesian tradition is the 20th century's substitute for theology and should, like God, be gently laid to rest* (1997, p. 559).

Roger Lewin, in his discussion of human consciousness, suggested that "Cartesian dualism dominated philosophical thinking for three centuries until the British philosopher Gilbert Ryle effectively demolished it" (1992, p. 157). Ryle's attack upon Cartesian dualism was only the first of many to follow, leading E.O. Wilson to conclude: "Virtually all contemporary scientists and philosophers expert on the subject agree that the mind, which comprises consciousness and rational process, is the brain at work. They have rejected the mind-brain dualism of René Descartes…" (1998, p. 98). Or, as Michael Lemonick wrote, "Descartes was dead wrong" (2001, p. 63).

Monism

Was Descartes "dead wrong"? We do not believe that he was. We now examine monistic theories of consciousness.

Perhaps a definition of "monism" is in order. The *American Heritage Dictionary* defines monism as:

> the view in metaphysics that reality is a unified whole and that all existing things can be ascribed to or described by a single concept or system; the doctrine that mind and matter are formed from, or reducible to, the same ultimate substance or principle of being.

Ruse offered this assessment:

> *Consciousness, in some way, is simply a manifestation of the physical world.* Spinoza and his modern-day followers do not want to say that consciousness does not exist, or that it is simply material substance in a traditional way. Consciousness is obviously not round, or red, or hard, or anything like that. Rather, consciousness in some sense is emergent from or an aspect of material substances. *In other words, the notion of material substance has to be extended, from red and round and hard, to include consciousness* (2001, pp. 199–200).

According to this view, the human brain is considered to be an electrochemical machine. The mind and the brain are one, with the mind being merely an extension of the physical mechanisms of the brain (and being entirely dependent upon those mechanisms for its existence/expression). The pillar upon which modern neural science is founded—materialistic monism—contends that *all* behavior is a reflection of brain function. Thus, according to this view, everything that a person says, thinks, and does can be accounted for by certain physical actions within the brain. The "mind"—such as it is—therefore is reduced to a range of functions carried out by the physical matter within the brain. This reductive perspective allows evolutionists to then declare that matter is all that exists, and that the human brain and mind evolved from lower animals, so that humans have no "spiritual" component. There is, so it has been said, no "ghost in the machine."

Today, "for the most part, materialism, the philosophical alternative to dualism, dominates modern thinking about consciousness" (Lewin, 1992, p. 157). Lord E.D. Adrian admitted: "…[B]y the beginning of the century it was becoming more respectable for psychologists to use some kind of monism as a working hypothesis and even to be whole-hearted behaviorists" (1965, p. 239). Sir John Eccles commented:

> *The dominant theories of the brain-mind relationship that are today held by neuroscientists are purely materialistic* in the sense that the brain is given complete mastery. The existence of mind or consciousness is not denied, but it is relegated to the passive role of mental experiences accompanying some types of brain action, as in psychoneural identity, but with absolutely no effective action on the brain…. Actually, it is rare for this to be stated so baldly, but despite all the sophisticated cover-up the situation is exactly as stated. *An effective causality is denied to the self-conscious mind per se* (1992, p. 17).

Dr. Eccles' assessment is absolutely correct, and provides a satisfactory springboard from which we can investigate the "the dominant theories of the brain-mind relationship."

Psychical Monism

We discuss psychical monism first, in order to quickly dispense with it. This doctrine contends that *consciousness is the only reality—i.e., the material world only "appears" to be there*. Thoughts are causally connected, but physical events are not necessarily so. (This doctrine is the exact inverse of epiphenomenalism.) As Carrington pointed out:

> The contention of this theory is that nothing exists save states of consciousness in the individual. Neither the material world nor other minds exist (save in the mind of the individual). In refutation of this theory, it may be pointed out that, if brain changes are thus caused by, or are the outer expression of, thought—why not muscular changes, and in fact all physical phenomena throughout the world everywhere—for we cannot rationally draw the line of distinction here. Such is the logical outcome of the theory…. While many philosophers are inclined to accept this view, it may be stated that the *physical scientists are naturally repelled by it, and so is common sense* (1923, pp. 52,53).

Common sense is indeed "repelled" by psychical monism—more popularly known as solipsism—which, according to the *Cambridge International Dictionary of English*, is "the theory or view that the self is the only reality." Carrington correctly concluded: "This doctrine is so opposed to common sense and daily experience that it is unnecessary to dwell upon it" (p. 53).

Radical Materialism (Functionalism)

Currently, there exists a small-but-vocal group of philosophers that parades under the title of the "radical materialists." Previously, we quoted from Eccles and Robinson, who noted: "The existence of mind or consciousness is not denied *except by radical materialists*…" (1984, p. 34). According to Eccles, in radical materialism, "there is a denial or repudiation of the existence of mental events. They are simply illusory. The brain-mind problem is a non-problem" (1992, pp. 17–18). Today, it is unlikely that anyone is better known for defending the concept of "radical materialism" in a more formidable fashion than Daniel C. Dennett, whose reverence for Ryle's work is unabashed, and who has written many books on human consciousness (1984; 1987; 1991; 1996; 1998), including one titled *Consciousness Explained* (1991). Speaking of that book and its author,

Andrew Brown wrote:

> It is difficult to think of anyone else who would have the self-confidence to write a book called simply *Consciousness Explained*, or the nerve, once it was finished, to publish the contents under that title. It's a wonderful book; but it doesn't explain consciousness. *The heart of Dennett's position seems to be that consciousness itself is a misleading category, and that the only way to make sense of it is to redefine all one's terms in terms of externally visible states and behaviours*.... He has devoted his life to exorcising the ghost from the machine (1999, pp. 153,154).

Paul Ehrlich stated: "In *Consciousness Explained*, he takes an interesting cut at the problem, but he does not 'explain' consciousness to my satisfaction" (2000, p. 112). Nor did he explain it to anyone else's. Sir John Eccles quoted Dennett's statement from page 21 of *Consciousness Explained*, "human consciousness is just about the last surviving mystery," and then wryly commented: "It is still a mystery at the end of his 468-page book" (p. 31). In a review of Daniel Dennett's 2003 book, *Freedom Evolves*, Galen Strawson commented:

> In the last several years the philosopher Daniel C. Dennett has published two very large, interesting and influential books. The first, *Consciousness Explained* (1991), aimed to account for all the phenomena of consciousness within the general theoretical framework set by current physics. It failed, of course, and came to be affectionately known as *Consciousness Ignored*... (2003).

Dennett has indeed "devoted his life to exorcising the ghost from the machine." Speaking of himself, and others of his ilk, he wrote:

> For other, more theoretically daring researchers, there is a new object of study, the mind/brain. This newly popular coinage nicely expresses the prevailing materialism of these researchers, who happily admit to the world and to themselves that what makes the brain particularly fascinating and baffling is that somehow or other it IS the mind (1991, pp. 38–39).

As one might expect, the radical materialism espoused by Dennett has not gone down well with those who believe that consciousness *does* exist, and that it *does* matter. Even among some of his evolutionist colleagues, his ideas have drawn considerable (and substantial) criticism. In assessing Dennett's work, Trefil wrote:

> The problem comes when Dennett approaches the problem of consciousness. The first time I read his book, I became confused because about halfway through I began to think, "Hey—this guy doesn't think that consciousness exists".... Until you have explained how I come to that central conclusion about my own existence, you have not solved the problem of consciousness. *You certainly won't solve the problem by denying that consciousness exists.* For me, reading Dennett's book was a little like reading a detailed discussion on the workings of a transmission, only to be told that there is no such thing as a car (1997, pp. 182–184).

Two aspects of radical materialism are closely associated with Dennett. The first is what he refers to as "the intentional stance," which, not coincidentally, happens to be the title of one of his books (1987). Dennett's definition in that book was this: "The intentional stance is the strategy of prediction and explanation that attributes beliefs, desires, and other 'intentional' states to systems—living and nonliving" (p. 495). Griffin investigated Dennett's position, and concluded:

> The contemporary philosopher Daniel Dennett has advocated what he calls "the intentional stance" when analyzing not only human and animal cognition but also many examples of self-regulating inanimate mechanisms.... His insistence on including such simple devices as thermostats in this extended category of intentional systems *leads him to deny any special status to conscious mental experiences.... Dennett appears to be arguing that if a neurophysiological mechanism were shown to organize and guide a particular behavior pattern, this would rule out the possibility that any conscious mental experiences might accompany or influence such behavior*... (2001, p. 263).

Griffin, of course, is renowned in his own right for his work with animal consciousness—which is why he later raised the issue of how Dennett's work questions "whether conscious mental experiences occur *in other species*" (p. 263). But Dennett's position does not question consciousness solely "in other species." It is most notorious for calling into question whether consciousness occurs in *humans*.

The second aspect of radical materialism closely associated with Dennett is the concept of "functionalism." This view ultimately arises from Dennett's strong ties to the artificial intelligence (AI) community. In reviewing Dennett's position, Johanson and Edgar explained that he

> ...argues that consciousness can be understood from the metaphor of a computer. He views the mind as the software to the brain's hardware, a program that writes a narrative of our experience, edited and compiled from the multiple drafts of information streaming into the brain. In this view, the present moment of sensation is insignificant compared to the subsequent mental reflection and contemplation, from which meaning arises. Consciousness—the mind—is simply a product of the brain... (1996, p. 107).

As Scott put it, this is the view that "the essential aspects of mental dynamics will eventually be expressed as a formula

and represented on a system constructed from integrated computer circuits" (1995, p. 2).

What are the implications of Dennett's brand of functionalism in regard to things such as the mind/soul? Davies wrote:

> They do not deny that the brain is a machine, and that neurons fire purely for electrical reasons—*there are no mental causes of physical processes*. Yet they still appeal to causal relations between mental states: very crudely, thoughts cause thoughts, notwithstanding the fact that, at the hardware level, the causal links are already forged….
>
> Functionalism solves at a stroke most of the traditional queries about the soul. What stuff is the soul made of? The question is as meaningless as asking what stuff citizenship is made of or Wednesdays are made of. The soul is a holistic concept. It is not made of stuff at all. Where is the soul located? Nowhere. To talk of the soul as being in a place is as misconceived as trying to locate the number seven, or Beethoven's fifth symphony. Such concepts are not in space at all (1983, pp. 85,86).

If all of this strikes you as a bit odd, let us reassure you: you are not alone. In fact, even Daniel Dennett, the current high priest of functionalism, has admitted that his ideas generally do not go down terribly well. Beloff noted:

> In dismissing the third solution from further consideration, I can do no better than John Searle (*The Rediscovery of the Mind*, 1992, p. 8) when he says, "*if your theory results in the view that consciousness does not exist, you have simply produced a reductio ad absurdum of your theory*" (1994).

We agree. Suggesting that consciousness (a.k.a., self-awareness) does not exist *is absurd!* [That fact, nevertheless, has not kept some from actually denying that consciousness exists. Lawrence Kubie wrote in *Brain Mechanisms and Consciousness: A Symposium*: "Although we cannot get along without the concept of consciousness, actually there is no such thing" (Kubie, 1956, pp. 446).] Robert Wesson concluded:

> Self-awareness is a special quality of the mind…. Self-awareness is different from information processing; even when confused and unable to think clearly, one may be vividly aware of one's self and one's confusion. The essence of mind is less data processing than will, intention, imagination, discovery, and feeling. If some kinds of thinking can be initiated by a computer, others cannot (1997, p. 277).

Roger Lewin remarked:

> To say that the brain is a computer is a truism, because, unquestionably, what goes on in there is computation. But so far, no man-made computer matches the human brain, either in capacity or design…. Can a computer think? And, ultimately, can a computer generate a level of consciousness that Dan Dennett or Nick Humphrey, or anyone else, has in mind? (1992, p. 160).

Good questions, and we all know the answers to them, do we not?

One last item bears mentioning in regard to radical materialism. It has a counterpart in psychology—behaviorism. Paul Davies wrote:

> The materialist believes that mental states and operations are nothing but physical states and operations. In the field of psychology, *materialism becomes what is known as behaviourism, which proclaims that all humans behave in a purely mechanical way in response to extern stimuli* (1983, p. 82).

According to behaviorists, only the brain exists, and mind is just an "off-shoot" of it (referred to as an "epiphenomenon"—discussed below). In the discipline of behaviorism, "mind has no independent existence and the question of the origin of mind is entirely secondary to the question of the origin and nature of brain tissue" (Custance, 1980, p. 21).

But such a position presents its own set of problems. Richard Gregory discussed some of them.

> One can well imagine that the physical state of lack of food is monitored, and signaled to brain regions which activates food-seeking behaviour; and we might describe this in an animal, or another person, to include a sensation like our feeling of hunger. It is more difficult to conceive a physiological state for shame, or guilt, or pride…. *The issue is important. It raises the question of how physiology is related to psychology, and whether consciousness can be affected or controlled apart from physiological changes* (1977, pp. 278–279).

Behaviorism has fallen onto hard times of late—and for several good reasons, among which are the ones summarized below by Beloff, who referred to behaviorism as "methodologically misleading, philosophically false, and ideologically pernicious." And that was the kindest thing he had to say!

> My first charge against Behaviourism is that it commits what Aldous Huxley once called "The Original Sin of the Intellect: Oversimplification…. Secondly, I regard behaviourism as incompatible with any genuine morality…. Our conclusions were that it was methodologically misleading, philosophically false and ideologically pernicious. But in the end, *perhaps its most glaring fault is simply a certain unmistakable* SILLINESS *which qualifies it, surely, as one of the oddest intellectual aberrations of the twentieth century* (1962, pp. 47,48,49).

John Eccles (1994) threw down the gauntlet in what he termed a "challenge to all materialists" (p. x). He expressed sharp criticism of, among others, Sir Francis Crick and

his collaborator, Christof Koch, when he referred to their work as "science fiction of a blatant kind" (p. 30). But he reserved his harshest criticism for Daniel Dennett's brand of radical materialism when he referred to functionalism as an "impoverished and empty theory" (p. 33). Why characterize functionalism in such terminology? In John Searle's uncompromising words: "... the deeper objection can be put quite simply: the theory has left out the mind" (as quoted in Zeman, 2001, p. 1283).

Panpsychism

In his work, *Lay Sermons, Addresses, and Reviews*, Thomas H. Huxley had a chapter titled "On the Physical Basis of Life." Within that chapter was this sentence: "Thoughts are the expression of molecular changes in the matter of life, which is the source of our other vital phenomena" (1870, p. 152). Lord Adrian concluded: "…[N]ow we can add that there is no need to invoke extraphysical factors to account for any of the public activities of the brain…. Consciousness is a logical construction…. It arises when unconscious processes are integrated; its base line in the individual and in the animal kingdom is arbitrary" (1965, pp. 239–240,246).

This is the essence of the view known as panpsychism. When Gregory asked: "What is the relation between consciousness and the matter or functions of the brain?" (1977, p. 274), he hit at the very heart of panpsychism, which is the view that "some primordial consciousness attaches to all matter, presumably even to atoms and subatomic particles" (Eccles and Robinson, 1984, p. 37). As Eccles and Robinson remarked in regard to the radical materialism that we discussed above:

> The alternative is to espouse panpsychism. All types of panpsychists evade the problems by proposing that *there is a protoconsciousness in all matter*, even in elementary particles! According to panpsychism, the evolutionary development of brain is associated merely with an amplification and refinement of what was already there as a property of all matter. It merely is exhibited more effectively in the complex organizations of the brains of higher animals (p. 14).

Huxley put it like this: "Mind is a function of matter, when that matter has attained a certain degree of organization" (1871, p. 464). But, there is a caveat. To quote Eccles, while "it is asserted that all matter has an inside mental or protopsychical state, *since this state is an integral part of matter, it can have no action on it*" (1992, p. 17).

According to this view, then, consciousness *does* exist—everywhere, all the time, in every material thing. In the case of human beings, it "just happened" to come together in a "certain degree of organization" that permitted consciousness to be expressed, and generated self-awareness as the end result. However, after all is said and done, as Rupert Sheldrake correctly noted: "The conscious self [has]…a reality which is not merely derivative from matter" (1981, p. 203). Paul Davies commented: "We still have no clue how mind and matter are related, or what process led to the emergence of mind from matter in the first place" (1995). With some understatement, Zeman confessed: "…[W]e have no clear understanding of what kind of property could render physical events intrinsically mental" (2001, 124:1284). Not surprisingly, then, Eccles and Robinson concluded: "[Panpsychism] finds no support whatsoever in physics" (1984, p. 37).

Epiphenomenalism

During our discussion of the concept of consciousness, the terms "epiphenomenon," "epiphenomena," or "epiphenomenalism" have appeared. We postponed any discussion of epiphenomenalism until this point, because it is best considered under the subject of the monist-materialist views that we are discussing.

Epiphenomenalism, according to Eccles, is the view that "mental states exist in relation to some material happenings, but causally are completely irrelevant" (1992, pp. 17). The *Merriam-Webster Dictionary* defines epiphenomenon as "a secondary phenomenon accompanying another and caused by it." For example, pathologists frequently use the word to refer to the secondary symptoms of a disease. So, when Eccles says that epiphenomenalism suggests that mental states exist, but "causally are completely irrelevant," his point is that, like in a disease, *the symptom does not cause anything, but is itself caused by something else*. That, in essence, is how epiphenomenalism works. Shadworth Hodgson proposed that conscious mental events were caused by physical changes in the nervous system, but could not themselves cause physical changes. As one writer put it: "Like the whistle of a railway engine (which does not affect the engine), or the chime of a clock (which does not affect the clock), they were caused by (and accompanied) physical events, but they did not themselves act as causal agents. In a slightly later terminology, they were EPIPHENOMENA…" (Glynn, 1999, p. 8).

The man who referred to himself as "Darwin's bulldog," Thomas Huxley, coined the term "epiphenomenalism" in an article he authored for the *Fortnightly Review* in 1874. The time was ripe for him to originate such a concept because, as Beloff explained, "…the view that prevailed among scientists of the late 19th century was to look for the causes of our behaviour in the brain alone…. For the epiphenomenalist, the brain was a machine, like everything else in nature, and the mind no more than a passive reflec-

tion of its activity" (1994). Huxley, therefore,

> proposed that as the noise of the babbling brook is only a by-product of the rushing water, so the mind, though distinct from the brain, is nevertheless only a by-product of it. The brain therefore causes the mind as the brook causes the babbling, but the mind cannot have any influence on the brain any more than the babbling can have any influence on the brook. This was termed epiphenomenalism (Custance, 1980, p. 23).

Today, from the perspective of the reductionist-materialist, epiphenomenalism is as good an explanation as any, since "so far as we can tell, mental activity is always associated with nervous activity" (Glynn, 1999, p. 9). Griffin wrote: "Conscious thinking may well be a CORE FUNCTION of central nervous systems…. The fact that we are consciously aware of only a small fraction of what goes on in our brains has led many scientists to conclude that consciousness is an epiphenomenon or trivial by-product of neural functioning" (2001, p. 3).

Richard Lewontin and Stephen Jay Gould argued that language, consciousness, and, in fact, most of our other distinctively human mental capacities are merely "side effects" of the fact that our brain grew big for "other reasons" (reasons, they say, by the way, that cannot be reconstructed). According to Lewontin, our extraordinary human abilities are "epiphenomena of all those loose brain connections with nothing to do" (as quoted in Schwartz, 1999).

Referring to human consciousness as a "trivial by-product" or a "side effect" seems to be the height of folly (if not conceit). Being asked to think of self-awareness as a "symptom" of a "disease" (i.e., the brain) is not much better. And, apparently, we are not the only ones who think so. Eccles and Robinson referred to the concept of epiphenomenalism as "gibberish."

> The epiphenomenalist's causal theory should not be confused with the ordinary causal laws of the physical sciences. The latter are confined to the manner in which force and matter are distributed in time and space. But with epiphenomenalism we are faced with a radically different entity—a MENTAL entity—taken to be nonmaterial and nonphysical. *If it exists at all, then by definition it cannot be composed of or reduced to material elements or combinations thereof*. To say that it "arises" from these is, alas, gibberish (1984, p. 55).

But why is this the case? The two authors continued:

> But note that in any purely physical interaction, it is never NECESSARY that event A cause event B; it is merely contingently the case, given the composition and laws of the physical world, that events of type A happen to cause or faithfully lead to events of type B. Accordingly, to argue that brain states, in a natural-causal fashion, produce mental states is to admit that it could be otherwise. ALL PURELY NATURAL PHENOMENA COULD BE OTHER THAN THEY ARE. Thus, the epiphenomenalist, to the extent that he endorses a causal theory of brain-mind relationships, can never establish that the brain is NECESSARY in order that there be mind. There is nothing logically contradictory in the claim that there are minds without brain and brains without minds…. Once it is granted that there are genuinely mental (nonphysical) events, it follows that an exhaustive inventory of the PHYSICAL universe and its laws must be incomplete as an inventory of real existents, because mental events are left out. If there can be mind in addition to matter, there can mind without matter (p. 55).

No epiphenomenalist would willingly want to go *that far*. Mind without matter? Eccles and Robinson are absolutely correct, of course: "To argue that brain states…produce mental states is to admit that it could be otherwise." And it gets progressively worse for the epiphenomenalist, as Ian Glynn pointed out:

> *[I]f mental events are epiphenomena, they cannot have any survival value*. Darwin's struggle for existence is a struggle in the physical world, and if mental events cannot cause physical effects they cannot affect the outcome in that struggle. *But if they cannot affect the outcome—if they have no survival value—why should we have evolved brains that make them possible?*… That they make conscious thought possible is not relevant, for thought that merely accompanies behaviour without influencing it will be ignored by natural selection….
>
> *Even if the notion that mental events are epiphenomena is true, it leaves unexplained what most needs explaining. Why should particular physical changes in our nervous systems cause feelings or thoughts? Even epiphenomena need to be accounted for*…. So despite its promising start, the notion that mental events are epiphenomena has not got us out of the difficulties that a combination of commonsense and physics got us into (1999, pp. 10,11–12).

It seems that we keep returning to that phrase "common sense." And rightly so! Would that there were *more* of it in discussions by philosophers and scientists regarding the subject of human consciousness. Things that are counterintuitive may just be—*wrong*. Depriving humans of free will is no small matter. In speaking of the implications of John Searle's work, Rodney Cotterill remarked:

> Searle also stresses the importance of *intentionality*, by which he means that mental states are usually related to, or directed toward, external situations and circumstances….
>
> One aspect of intentionality concerns CHOICE, irrespective of whether this implies the exercise of free will. *Even if choices were not really free, the fact that we are able to handle it would still warrant contemplation*. Searle's point

> is well taken…. *Searle has identified one of the defining characteristics of the higher organism* (1998, p. 320).

Free will *is* "one of the defining characteristics of higher organisms." And it does exist—sort of.

Roger Sperry wrote:

> Unlike "mind," "consciousness," and "instinct," "free will" has made no comeback in behavioral science in recent years. Most behavioral scientists would refuse to list free will among our problems outstanding, or at least as an unanswered problem…. *Every advance in the science of behavior*, whether it has come from the psychiatrist's couch, from microelectrode recording, from brain-splitting, or from the running of cannibalistic flatworms, *seems only to reinforce that old suspicion that free will is just an illusion. The more we learn about the brain and behavior, the more deterministic, lawful, and causal it appears* (1977, p. 432).

And so, we are asked to believe that free will is "just an illusion." It appears that the best the evolutionists can do is to suggest that "in the abstract there may be no free will," but "in practice," there really is. Paul Ehrlich has suggested exactly that:

> That enormous complexity of our brains can also, in a way, explain humanity's famed "free will." …Thus, although in the abstract there may be no free will, in practice the brains of human beings evolved so that intentional individuals can make real choices and can make them within a context of ethical alternatives…. Natural selection has endowed us with the capacity to figure out a course of action in virtually any situation, "accepting" the possibility that a chosen course may prove unfortunate (2000, pp. 124,125).

[After reading a quotation like the one above from Ehrlich, we cannot help but wonder if the people who write such things ever read them?!]

But what is the *origin* of human free will? Steven Pinker is convinced that the explanation is "all in the circuits." He testified:

> *These circuits are what we call "free will," and providing them with information about the likely consequences of behavioral options is what we call "holding people responsible."* All normal people have this circuitry, and that is why the existence of genes with effects on behavior should not be allowed to erode responsibility in the legal system or in everyday life (2003, p. 99).

Not everyone is willing to buy into such a hypothesis, however. As Paul Davies asked: "Where is there room in the deterministic predictive laws of electrical circuitry for FREE WILL?" (1983, p. 74). Or, in the words of Daniel Dennett:

> If the concept of consciousness were to "fall to science," what would happen to our sense of moral agency and free will? If conscious experience were "reduced" somehow to mere matter in motion, what would happen to our appreciation of loge and pain and dreams and joy? If conscious human beings were "just" animated material objects, how could anything we do to them be right or wrong? (1991, pp. 24–25).

Sir John Eccles, though by his own admission a committed Darwinian (see Eccles, 1967, p. 7; 1977, p. 98), argued strongly—from his own research into the relationship between mental intentions and neural events—in behalf of free will, what he called "the freedom to know and freedom to act" (see Cousins, 1985, p. 152). As Eccles stated:

> If we can establish that we have freedom to bring about simple movements at will, then more complex social and moral situations must also in part at least be open to control by a voluntary decision, i.e., of mental thought processes. Thus we have opened the way to the consideration of personal freedom and moral responsibility (1985, p. 154).

There is one thing epiphenomenalism does *not* do—and that is "open the way to the consideration of personal freedom and moral responsibility." To quote E.O. Wilson:

> And old impasse nonetheless remains. *If the mind is bound by the laws of physics*, and if it can conceivably be read like calligraphy, *how can there be free will*? I do not mean free will in the trivial sense, the ability to choose one's thoughts and behavior free of the will of others and the rest of the world all around. I mean, instead, *freedom from the constraints imposed by the physiochemical states of one's own body and mind* (1998, p. 119).

If the mind is "bound by the laws of physics," then "how can there be free will?" Herbert Feigl lamented: "Scientific psychology, as the well-known saying goes, having first lost its soul, later its consciousness, seems finally to lose its mind altogether" (1967, p. 3).

The truth of the matter is, however, that: "If consciousness has a biological function at all, it must ultimately be manifest in behaviour" (Zeman, 2001, p. 1280). Yet, as Eccles and Robinson rightly remarked: "Observable *behavior* is not a reliable guide to comprehending the psychological dimension of life…. Morally we are possessed of 'oughts,' which, as we have argued, have absolutely no material or physical reference" (1984, pp. 52,169).

Identity Theory

Earlier, we quoted Gordon Taylor, who has acknowledged that monists are "split into those who deny that mental events exist at all…and *those who claim that mental events are just physical events described in another language. This last position [is] known as identity theory*" (1979, pp. 20–21). Herbert Feigl, one of the identity theory's most ardent defenders, described the concept in this manner:

> I think that it is precisely one of the advantages of the

> identity theory that *it removes the duality of two sets of correlated events*, and replaces it by the much less puzzling duality of *two ways of knowing the same event*—one direct, the other indirect (p. 106).

In our judgment, identity theory is not exactly an easy concept to comprehend. Listen to the following definition offered by Feigl, who began by stating that "it will be advisable first to state my thesis quite succinctly," and then offered the following "succinct" summary:

> The raw feels of direct experience as we "have" them, are empirically identifiable with the referents of certain specifiable concepts of molar behavior theory, and these in turn are empirically identifiable with the referents of some neurophysiological concepts…. *The identity thesis which I wish to clarify and to defend asserts that the states of direct experience which conscious human beings "live through," and those which we confidently ascribe to some of the higher animals, are identical with certain aspects of the neural processes in those organisms*….[I]dentity theory regards sentience…[as] the basic reality (1967, pp. 78,79,107).

Feigl's "clarification" appears to be anything but. Let us simply note by way of summary that identity theory (a.k.a., "phenomenalistic parallelism") suggests that while sentience itself is indeed "the basic reality," whatever hints of consciousness that an organism (including a human) might experience are, in fact, the end result of "neural processes." Brain and consciousness (or mind and body) are but two different expressions of one underlying reality—just as the convex and concave surfaces of a sphere are but two expressions of an underlying reality. As Ruse described it:

> [M]ost Darwinians who think about these sorts of things are inclined to some kind of monism, or (as it is often known today) to some kind of *identity theory*. They think that *body and mind are manifestations of the same thing*, and that as selection works on one it affects the other, and as it works on the other it affects the former (2001, pp. 199–200).

The key phrase, of course, is that "body and mind are manifestations of the same thing." And so, "mental" events are just "physical" events" described in another language. Eccles offered this synopsis:

> Mental states exist as an inner aspect of some material structures that in present formulations are restricted to brain structures such as nerve cells. This postulated "identity" may appear to give an effective action, just as the "identical" nerve cells have an effective action. However, *the result of the transaction is that the purely material events of neural action are themselves* SUFFICIENT *for all brain-mind responses* (1992, pp. 17–18).

However, Eccles had earlier debunked such a view.

> Most brain scientists and philosophers evade this confrontation across such a horrendous frontier by espousing some variety of psychoneural parallelism. The conscious experiences are regarded as merely being a spin-off from the neural events, every neural event being postulated by its very nature to have an associated conscious experience. This simple variety of parallelism is certainly mistaken, because the great majority of neural activities in the brain do not give rise to conscious experiences. Parallellism also is unable to account for the experience that thought can give rise to action, as in the so-called voluntary movements, which must mean that cognitive events can effect changes in the patterns of impulse discharges of cerebral neurons….
>
> The most telling criticism against parallelism can be mounted against its key postulate that the happenings in the neural machinery of the brain provide A NECESSARY AND SUFFICIENT EXPLANATION OF THE TOTALITY BOTH OF THE PERFORMANCE AND OF THE CONSCIOUS EXPERIENCE OF A HUMAN BEING (1977, pp. 75–76).

Furthermore, four years prior to that, Dr. Eccles had pointed out that, in identity theory,

> …it is postulated that all neuronal activity in the cerebrum comes through to consciousness somehow or other and is all expressed there. An often-used analogy is that neuronal activity and conscious states represent two different views of the same thing, one as seen by an external observer, the other as an inner experience by the "owner" of the brain. *This proposed identification, at least in its present form, is refuted by the discovery that after commissurotomy, none of the neuronal events in the minor hemisphere are recognized by the conscious subject* (1973, pp. 218–219).

[A commissurotomy is a procedure wherein the corpus callosum (the great tract of approximately 200 million nerve fibers) that links the brain's two hemispheres is surgically severed, thereby disconnecting the two hemispheres from each other. Connections of the hemispheres to lower brain regions (known as the basal ganglia or midbrain) remain intact, and the person on whom the surgery has been performed remains relatively unaffected (Eccles, 1989, pp. 205–210).] Dr. Eccles' point is well taken. If certain neuronal events no longer are recognized by the "owner" of the brain, yet that "owner" still is conscious, the consciousness is something more than simply "neuronal events." In the book Eccles edited on *Brain and Conscious Experience*, he had concluded: "There can be much complex functional activity going on in the fully organized human brain and yet it does not reach consciousness. *I think it is very important to appreciate that it is not just complex nerve structure that gives consciousness*" (1966, p. 499).

John Searle (1992) argued that mental phenomena are caused by neurophysiological processes in the brain,

and are themselves features of the brain. He referred to this point of view as "biological naturalism," and suggested that "mental processes are as much a part of our biological natural history as digestion, mitosis, meiosis, or enzyme secretion" (see Scott, 1995, p. 132). Beloff, in his discussion of identity theory, expressed serious doubts about its explicatory value.

> Thus the so-called "mind-brain identity" theory, associated with Herbert Feigl in the United States and with Bertrand Russell in Britain, which flourished during the 1950s, insisted that the mental events we associate with consciousness just ARE the relevant brain events but viewed, as it were, from the inside rather than the outside. Whether such a formulation is even tenable, I am still very doubtful; *it begs the question as to whether two entities that have entirely different properties could, ontologically, be regarded as one and the same* (1994).

But surely that is just the point! How can two entities that have completely different properties be regarded as "one and the same"? Is it not obvious that identity theory fails to account for the important *qualitative* properties of consciousness—the features that we experience in the first person as an "I" or a "me." Identity theory cannot begin to explain what Eccles referred as "the certainty of my inner core of unique individuality" (1992, p. 240).

Nonreductive Materialism/Emergent Materialism

Without doubt, one of the most vocal supporters of monistic materialism is Sir Francis Crick (1994), who suggested that, eventually, *everything* will be explicable in terms of the neural pathways in the brain—a claim that he correctly identified in the title of his book as "astonishing!" During the twentieth century, refinements of monistic-materialistic concepts appeared under the name of *nonreductive materialism*. C.D. Broad and certain of his contemporaries held the view that the brain is the seat of all mental capacities, but they simultaneously maintained that while "mental states" *emerge from* the physical substratum of the brain, those mental states are not *reducible to* the brain. This view came to be called *emergent materialism* (see Wyller, 1996, p. 215). In the words of Jerome Elbert:

> EMERGENT PROPERTIES OF MATTER [ARE] DESCRIBED AS PROPERTIES THAT EMERGE FROM MATTER WHEN SPECIAL CIRCUMSTANCES APPLY TO IT, SUCH AS THE ORGANIZATION OF THE MATTER INTO LARGE NUMBERS OF SIMILAR UNITS THAT CAN INTERACT WITH EACH OTHER. CONSCIOUSNESS MAY BE THE MOST CHALLENGING EXAMPLE OF SUCH AN EMERGENT PROPERTY. It gives matter a radically new property that is acquired only under very special conditions. Think of what a tiny fraction of the solar system's matter is conscious! (2000, pp. 215,243).

Alwyn Scott concurred: "Thus, I suggest, consciousness is an EMERGENT phenomenon, one born of many discrete events fusing together as a single experience" (1995, p. 3).

One of the best-known advocates of emergentism is philosopher John Searle. In opposition to the pure reductionists, Searle argues that first-person mental experiences ("I am in pain") cannot be reduced to mere neural firings, for in so doing, important first-person features like subjectivity are lost. In opposition to the dualists, however, Searle suggests that the strict dichotomy between mental and physical properties should be discarded. Mental properties are simply "one kind of property" that physical things can possess. *Pain and other mental phenomena are just features of the brain (and perhaps the rest of the central nervous system)* [Searle, 1984, p. 19]. Consciousness, therefore, is simply a higher-order feature of the brain. Searle denies that consciousness transcends the physical, or that it possesses causal powers that cannot be explained by the interactions of the brain's neurons. According to this view, as Reichenbach and Anderson pointed out, "consciousness has no life of its own apart from that in which it is realized. But because of this, Searle's emergentist view leaves no room for free moral agency" (1995, p. 286). Such an assessment is correct, as Searle himself admitted:

> *As long as we accept this conception of how nature works, then it doesn't seem that there is any scope for the freedom of the will* because on this conception the mind can only affect nature in so far as it is a part of nature. But if so, then like the rest of nature, its features are determined at the basic micro-level of physics (1984, p. 93).

Consciousness, then, according to this theory, is viewed as something that has "emerged from" the neural pathways of the brain, but, in and of itself, is not reducible to those neural pathways.

Another well-known advocate of the nonreductive physicalist viewpoint is Roger Sperry, who adopted a view diametrically opposed to that of Crick's monist-materialism, yet was unwilling to accept the form of dualism advocated by Eccles. He concluded:

> *Consciousness is conceived to be a dynamic emergent property of brain activity, neither identical with nor reducible to, the neural events of which it is mainly composed*…. Consciousness exerts potential causal effects on the interplay of cerebral operations…. In the position of top command at the highest levels in the hierarchy of brain organization, the subjective properties were seen to exert control over the biophysical and chemical activities at subordinate levels (as quoted in Jeeves, 1998, p. 88).

Sperry's concept is what is referred to as a "top-down view" (like that of Dr. Eccles) where mental events are given ontological priority. But, unlike Eccles, Sperry is adamant

about avoiding any hint of dualism. Thus, while the emergent materialists may claim that mental states emerge from the physical substratum of the brain without being reducible to the brain, the fact remains, as Ernst Mayr noted, "emergentism is a thoroughly materialistic philosophy" (1982, p. 64).

The nonreductive physicalist view regards mental activity and correlated brain activity as "inner" and "outer" aspects of one complex set of events, which together constitute "conscious human agency." As Jeeves explained:

> The irreducible duality of human nature is on this view seen as *duality of aspects rather than duality of substance*…. It does not mean that the mind is a mere epiphenomenon of the physical activity of the brain. We may think of the way the mind "determines" brain activity as analogous to the relation between the software and the hardware of our computers. According to this view, we regard mental activity as EMBODIED IN brain activity rather than as being IDENTICAL WITH brain activity (1998, p. 89).

Sperry discussed the concepts behind emergent materialism. He began by noting that, in emergent materialism, "the traditional difference between the physical and the mental (as subjectively perceived) is deliberately retained, but with these previously separate, dual realms not inextricably merged..." (1994, p. 110). In Sperry's view, conscious or mental phenomena are "dynamic, emergent phenomena (or configurational) properties of the living brain in action" (1985, p. 66). In commenting on this, Cousins remarked:

> This seems to imply that the source of mental intentions is the brain itself in living action—but that once these emergent mental properties appear, they have causal control potency over the "lower" activities of the brain at the subnuclear, nuclear and molecular levels. *Mind emerges from brain, then takes charge as chief or director in the complex chain of command within the brain*. In Sperry's view, there is no need to appeal to any source outside the living brain in order to explain the origin and existence of mental phenomena (1985, pp. 66–67).

Cousins is correct. Sperry stated:

> One can agree that the scientific evidence speaks against any preplanned purposive design of a supernatural intelligence. At the same time the evidence shows that the great bulk of the evolving web of creation is governed by a complex pattern of great intricacy with many mutually reinforcing directive, purposive constraints at higher levels, particularly. The "grand orderly design" is, in a sense, all the more remarkable for having been self-developed (1985, p. 87).

But Sperry did not end there. Rather, he went on to comment:

> In my view, *mental phenomena as dynamic emergent properties of physical brain states become inextricably interfused with, and thus inseparable from, their physiologic substrates*…. [I]t still seems to me a mistake overall to abandon the age-old common-sense distinction between mind and matter, the mental and the physical. This basic common distinction long preceded the varied philosophic jargon and scientific terminology. *The highly distinctive specialness of conscious states with their subjective qualities does not go away just because they are taken to be emergent properties of physical brain processes* (pp. 109–110,111).

Dr. Sperry appears to "want it both ways." He believes that it is a mistake to abandon the distinction between the physical and the mental, and admits that consciousness endows a "highly distinctive specialness" that does not disappear just because someone (like him) claims that it is merely an "emergent property of physical brain processes." Yet he wants to believe that "the scientific evidence speaks against any preplanned purposive design of a supernatural intelligence" and that "there is no need to appeal to any source outside the living brain in order to explain the origin and existence of mental phenomena." Richard Heinberg contradicted Sperry with commonsense facts of nature when he commented:

> We each make plans, formulate goals, and pursue strategies routinely. And there is every indication that other creatures do the same, if perhaps not as consciously. The evidence is so persuasive that many biologists who otherwise subscribe to a reductionist-mechanist view are nevertheless forced to acknowledge some capacity of inner purpose on the part of organisms (1999, pp. 65,67–68).

Medawar and Medawar wrote in agreement: "Purposiveness is one of the distinguishing characteristics of living things. OF COURSE birds build nests in order to house their young, and equally obviously, the enlargement of a second kidney when the first is removed comes about to allow one kidney to do the work formerly done by two" (1977, pp. 11–12). Cell biologist Edmund Sinnot remarked:

> Life is not aimless, nor are its actions at random. They are regulatory and either maintain a goal already achieved or move toward one which is yet to be realized…. [Every living thing exhibits] activity which tends toward a realization of a developmental pattern or goal…. Such teleology [purpose], far from being unscientific, is implicit in the very nature of the organism (1961, p. 41, bracketed items added).

Sir John Eccles strongly disagreed with Sperry, when he wrote:

> Great display is made by all varieties of materialists that their brain-mind theory is in accord with natural law as it now is. However, this claim is invalidated by two most

> weighty considerations. Firstly, *nowhere in the laws of physics or in the laws of the derivative sciences, chemistry and biology, is there any reference to consciousness or mind*.... Regardless of the complexity of electrical, chemical or biological machinery, there is no statement in the "natural laws" that there is an emergence of this strange non-material entity, consciousness or mind. This is not to affirm that consciousness does not emerge in the evolutionary process, but merely to state that *its emergence is not reconcilable with the natural laws as at present understood* (1992, pp. 19–20).

Sperry may *want* emergent materialism to be true, but, as Eccles so eloquently pointed out, such "is not reconcilable with the natural laws as at present understood."

Dualist-Interactionism

As we began our examination of theories of human consciousness, we quoted Gordon Taylor, who assessed a number of the theories of the mind and then stated: "None of these views, I may as well warn you, stands up to inspection" (1979, pp. 20–21). Our comment at the time was: "As we bring this discussion on consciousness to a close, we want to offer a third alternative that *does* 'stand up to inspection.'" Earlier, we quoted from Adam Zeman who, in his review, "Consciousness," mentioned that "the current fascination with consciousness reflects the mounting intellectual pressure to explain how 'vital activity' in the brain generates a 'mental element,' with rich subjective content" (2001, p. 1284). In other words: *Whence comes consciousness*?

Surely, by now it is evident from our review that all of the monist-materialistic concepts have failed miserably to offer any cogent, consistent, and adequate theory about the origin of human consciousness. Acknowledgment of that fact prompts the question: "Why, then, do so many scientists and philosophers cling to the monist-materialist viewpoint?"

We are convinced that the monist-materialistic view has remained so deeply ingrained because the only legitimate alternative—some form of dualism—postulates a supernatural origin for human self-awareness! And we cannot do better to prove our point than to quote from Daniel Dennett.

> In short, the mind is the brain. According to the materialists, we can (in principle) account for every mental phenomenon using the same physical principles, laws, and raw materials that suffice to explain radioactivity, continental drift, photosynthesis, reproduction, nutrition, and growth. *It is one of the main burdens of this book to explain consciousness without ever giving in to the siren song of dualism*....
>
> The standard objection to dualism was all too familiar to Descartes himself in the seventeenth century, and it is fair to say that neither he nor any subsequent dualist has ever overcome it convincingly. If mind and body are distinct things or substances, they nevertheless must interact; the bodily sense organs, via the brain, must inform the mind, must send to it or present it with perceptions or ideas or data of some sort, and then the mind, having thought things over, must direct the body in appropriate action. Hence the view is often called Cartesian interactionism or interactionist dualism....
>
> There is the lurking suspicion that the most attractive feature of mind stuff is its promise of being so mysterious that it keeps science at bay forever. *This fundamentally unscientific stance of dualism is, to my mind, its most disqualifying feature, and is the reason why in this book I adopt the apparently dogmatic rule that dualism is to be avoided at all costs.* It is not that I think I can give a knock-down proof that dualism, in all its forms, is false or incoherent, but that, given the way dualism wallows in mystery, *accepting dualism is giving up* (1991, pp. 33,34,37).

In Dennett's view, *monistic-materialism must rule!* The acceptance of something—anything—outside of science is unthinkable, and represents what Jacques Monod referred to as "animism" (belief in spirits). In his book, *Chance and Necessity*, Monod addressed this matter in very blunt terms.

> Animism established a covenant between nature and man, a profound alliance outside of which seems to stretch only terrifying solitude. Must we break this tie because the postulate of objectivity requires it? [Monod answers "Yes!"—BT/BH]
>
> ...[A]ll these systems rooted in animism exist outside objective knowledge, outside truth, and are strangers and fundamentally HOSTILE to science, which they are willing to use but do not respect or cherish. The divorce is so great, *the lie so flagrant, that it can only obsess and lacerate anyone who has some culture or intelligence*, or is moved by that moral questioning which is the source of all creativity. It is an affliction, that is to say, for all those who bear or will bear the responsibility for the way in which society and culture will evolve....
>
> The ancient covenant is in pieces; *man knows at last that he is alone in the universe's unfeeling immensity, out of which he emerged only by chance* (1972, pp. 31,171–172,180).

Animism, says Monod, is a "lie so flagrant, that it can only obsess and lacerate anyone who has some culture or intelligence." Why does he write in such terrifyingly angry words about a belief in something other than the monist-materialist viewpoint? Perhaps Carrington answered that question best when he wrote that in animism

> …we have the world-old notion of mind or soul, and body, existing as separate entities, influencing each other. Mind is here supposed to influence matter, and utilize it for the purposes of its manifestation. Were such a theory true, it would of course enable us to accept not only the reality of psychic phenomena but *the persistence of individual human consciousness after death. The main objection to this doctrine is that it postulates a form of* DUALISM, *which is very obnoxious to many minds!* It is possible, however, that such a doctrine may one day be forced upon us by the gradually increasing evidence furnished us by psychical research (1923, p. 53).

Those of the monist-materialist bent know full well what the implications would be if they were to allow any form of dualism. As Custance asked: "[H]ow can we account for 'mind' if it did not originate in the physical world?" (1980, p. 20). Let us answer that by quoting two of Monod's evolutionist colleagues—Eccles and Robinson.

> It is not in doubt that each human recognizes its own uniqueness…. *Since materialist solutions fail to account for our experienced uniqueness, we are constrained to attribute the uniqueness of the psyche or soul to a supernatural creation.* To give the explanation in theological terms: Each soul is a Divine creation, which is "attached" to the growing fetus at some point between conception and birth. It is the certainty of the inner core of unique individuality that necessitates the "Divine creation." *We submit that no other explanation is tenable* (1984, p. 43).

Strong stuff, that. But equally strong was their out-and-out condemnation of the monist-materialist viewpoint.

> [T]he denial of the reality of mental events, as in radical materialism, is an easy cop-out…. *Radical materialism should have a prominent place in the history of human silliness. We regard promissory materialism as a superstition without a rational foundation.* The more we discover about the brain, the more clearly do we distinguish between the brain events and the mental phenomena, and the more wonderful do both the brain events and the mental phenomena become. *Promissory materialism is simply a religious belief held by dogmatic materialists…who often confuse their religion with their science* (1984, pp. 17,36).

So what is the alternative? Darwin's contemporary, Alfred Russel Wallace, addressed that question in 1903 when he wrote:

> The other body and probably much larger would be represented by *those who, holding that mind is essentially superior to matter and distinct from it, cannot believe that life, consciousness, mind and products of matter.* They hold that the marvelous complexity of forces, which appear to control matter, if not actually to constitute it, *are and must be mind products* (as quoted in Wyller, 1996, p. 231).

James Trefil conceded: "Nonetheless, *there is a sense in which something like Descartes' procedure remains valid for the question of human consciousness*" (1997, p. 181). Paul Davies wrote: "…[P]hysics, which led the way for all other sciences, is now moving towards a more accommodating view of mind…" (1983, p. 8). He is correct. In fact, speaking of Cartesian dualism, Custance maintained:

> The theory cannot be disproved so long as there are mental phenomena whose neural correlates remain unknown. That there ARE mental phenomena cannot be doubted for reasons which are logically compulsive and were adopted (though not invented) by Descartes; they cannot be doubted because the very act of doubting them establishes their reality. *The reality of conscious existence is confirmed each time it is denied*…. Most of the important thinkers who followed Descartes rejected interactionism…. *But slowly, as the evidence has accumulated, it appears that the monistic view is showing signs of insufficiency and a new dualism is in the making* (1980, pp. 30,31).

Custance is correct. There is now a "new dualism in the making." In speaking of the evolutionary emergence of self-consciousness, for example, various writers (e.g., Lack, 1961, p. 128; Lorenz, 1971, p.170) have even broached the subject of the "unbridgeable gap or gulf between soul and body." Carl Gustav Jung summed up this idea of a separate mind/body interaction when he said: "I simply believe that some part of the human Self or Soul is not subject to the laws of space and time" (as quoted in Davies, 1983, p. 72). Lord Adrian claimed: "…[T]he gulf between mental and material can scarcely be called self-evident." Then he quietly admitted:

> Yet for many of us there is still the one thing which does seem to lie outside that tidy and familiar framework. That thing is ourself, our ego, the I who does the perceiving and the thinking and acting, the person who is aware of his identity and his surroundings. As soon as we let ourselves contemplate our own place in the picture we seem to be stepping outside the boundaries of natural science (1965, pp. 239,240).

Or, as Eccles concluded: "It is my thesis that we have to recognize that the unique selfhood is the result of a supernatural creation of what in the religious sense is called a soul" (1982, p. 97).

Notice Carrington's conclusion, however: "It is possible, however, that such a doctrine may one day be forced upon us by the gradually increasing evidence furnished us by psychical research" (1923, p. 53). Even Zeman admitted that "a number of commentators believe that some version of this…'dual-aspect' theory holds out the greatest promise of an eventual solution to the philosophical conundrum

of consciousness" (2001, 124:1284). Roger Lewin conceded:

> [F]or the most part, materialism, the philosophical alternative to dualism, dominates modern thinking about consciousness…. True, Cartesian *dualism is not completely dead*, as evidenced in the views of Sir John Eccles, one of this century's greatest neurologists… (1992, p. 157).

John Gliedman admitted:

> From Berkeley to Paris and from London to Princeton, prominent scientists from fields as diverse as neurophysiology and quantum physics are coming out of the closet and *admitting they believe in the possibility, at least, of such unscientific entities as the immortal human spirit and divine creation* (1982, p. 77).

One of the scientists discussed by Mr. Gliedman at some length was Sir John Eccles. Daniel Dennett wrote: "Ever since Gilbert Ryle's classic attack (1949) on what he called Descartes' 'dogma of the ghost in the machine,' dualists have been on the defensive" (1991, p. 33). *Not any more!* He was opposed by John Eccles. Dr. Eccles, until his death in 1997 at the age of 94, was one of the world's most eminent electrophysiologists. He graduated from Oxford, where he studied under the man he called "the greatest neuroscientist of the age, Sir Charles Sherrington" (Eccles, 1994, p. 13). He was knighted by Queen Elizabeth II in 1958, and five years later in 1963 won the Nobel Prize in Medicine or Physiology (shared with Alan L Hodgkin and Andrew F. Huxley) for his research on the biophysical properties of synaptic transmission. Gliedman had this to say about Eccles:

> At age 79, Sir John Eccles is not going "gentle into the night." Still trim and vigorous, the great physiologist has declared war on the past 300 years of scientific speculation about man's nature. Winner of the 1963 Nobel Prize in Physiology or Medicine for his pioneering research on the synapse—the point at which nerve cells communicate with the brain—*Eccles strongly defends the ancient religious belief that human beings consist of a mysterious compound of physical and intangible spirit…. Our nonmaterial self controls its "liaison brain" the way a driver steers a car or a programmer directs a computer. Man's ghostly spiritual presence, says Eccles, exerts just the whisper of a physical influence on the computerlike brain, enough to encourage some neurons to fire and others to remain silent*. Boldly advancing what for most scientists is the greatest heresy of all, Eccles also asserts that our nonmaterial self survives the death of the physical brain (1982, p. 77).

Anyone familiar with neurophysiology or neurobiology knows the name of Sir John Eccles. (One of us [BH] studied Dr. Eccles' works while earning a Ph.D. in neurobiology.) But for those who might not be familiar with this amazing gentleman, we would like to introduce Dr. Eccles via the following quotation that Norman Geisler authored:

> The extreme form of materialism believes that mind (or soul) *is* matter. More modern forms believe mind is REDUCIBLE TO matter or DEPENDENT ON it. *However, from a scientific perspective much has happened in our generation to lay bare the clay feet of materialism. Most noteworthy among this is the Nobel Prize winning work of Sir John Eccles. His work on the brain demonstrated that the mind or intention is more than physical. He has shown that the supplementary motor area of the brain is fired by mere intention to do something, without the motor cortex of the brain (which controls muscle movements) operating.* So, in effect, the mind is to the brain what an archivist is to a library. The former is not reducible to the latter (1984, pp. 140–141).

Eccles, and his lifelong friend, Sir Karl Popper viewed the mind as a distinctly non-material entity. But neither did so for religious reasons. Dr. Eccles was a committed Darwinian evolutionist (as was Popper). Rather, they believed what they did about the human mind because of their scientific research! Speaking specifically of human self-consciousness, Eccles wrote:

> It is dependent on the existence of a sufficient number of such critically poised neurons, and, consequently, only in such conditions are willing and perceiving possible. However, it is not necessary for the whole cortex to be in this special dynamic state…. On the basis of this concept [activity of the cortex—BT/BH] we can face up anew to the extraordinary problems inherent in a strong dualism—interaction of brain and conscious mind, brain receiving from conscious mind in a willed action and in turn transmitting to mind in conscious experiences…. *Let us be quite clear that for each of us the primary reality is our consciousness—everything else is derivative and has a second order reality*. We have tremendous intellectual tasks in our efforts to understand baffling problems that lie right at the center of our being (1966, pp. 312,327).

Dr. Eccles spent his entire adult life studying the brain-mind problem, and concluded that the two were entirely separate. In the book from which we quoted (*Nobel Conversations*), Norman Cousins, who moderated a series of conversations among four Nobel laureates, including Dr. Eccles, made the following statement: "Nor was Sir John Eccles claiming too much when *he insisted that the action of non-material mind on material brain has been not merely postulated but scientifically demonstrated*" (1985, p. 68). Eccles wrote:

> When I postulated many years ago, following Sherrington, that there was a special area of the brain in liaison with consciousness, I certainly did not imagine that any definitive experimental test could be applied in a few years. But now we have this distinction between the dominant hemisphere in liaison with the conscious self, and the minor hemisphere with no such liaison (1973, p. 214).

We add this note. On March 15, 1952, the *British Medical Journal* ran an obituary notice for Sir Charles Sherrington. The notice read as follows:

> The death on March 4, 1952 of Sir Charles Sherrington at the age of 94 marked the passing of the man of genius who laid the foundations of our knowledge of the functioning of the brain and spinal cord. His classic work *Integrative Action of the Nervous System*, published in 1906, is still a source of inspiration to physiologists all over the world. It was reprinted as recently as 1947 for the first post-war (World War II) International Congress on Physiology. His work did for neurology what the atomic theory did for chemistry. It is still refreshing as it was in 1906, and it has needed no revision.

How embarrassing it must be for evolutionists to have to admit that this "genius" who "laid the foundation of our knowledge of the functioning of the brain and spinal cord" told one of his prized students, Sir John Eccles, just prior to his (Sherrington's) death: "*For me now, the only reality is the human soul*" (as quoted in Popper and Eccles, 1977 p. 55). What an amazing statement from the man who constructed many of the pillars on which modern neuroanatomy now stands! Cousins continued:

> *Eccles is the one who showed that the mental acts of intention* INITIATE *the burst of discharges in a nerve's brain cell.* He has tried to re-enfranchise the human mind, to get science to recognize thinking as a more comprehensive human activity than the mere operation of neural mechanisms….
>
> In any event it is clear that both you [Eccles—BT/BH] and Dr. [Roger] Sperry are upholding a "mentalist revolution" in science. Strictly orthodox materialists may doubt such a revolution and label it an atavistic throwback to "prescientific" perceptions of nature which believed that non-material reality could act on the material. *But in fact, both of you have reached your conclusions through the rigorous discipline of the laboratory. If you are persuaded that mental realities initiate and direct biochemical reactions in the brain, it is scientific experimentation, not philosophical speculation, that has convinced you* (1985, pp. 56,21,57).

What, precisely is the relationship between mind and brain? Eccles answered as follows.

> How can the mental act of intention activate across the mind-brain frontier those particular SMA [supplementary motor area—BT/BH] neurons in the appropriate code for activating the motor programs that bring about intended voluntary movements? The answer is that, DESPITE THE SO-CALLED "INSUPERABLE" DIFFICULTY OF HAVING A NON-MATERIAL MIND ACT ON A MATERIAL BRAIN, IT HAS BEEN DEMONSTRATED TO OCCUR BY A MENTAL INTENTION—NO DOUBT TO THE GREAT DISCOMFITURE OF ALL MATERIALISTS AND PHYSICALISTS (1985, pp. 55–56).
>
> *[W]e have discovered that mental intentions act upon the SMA in a highly selective, discriminating manner.* In a fashion which is not yet fully understood, mental intentions are able to activate across the mind-brain frontier those PARTICULAR SMA neurons that are coded for initiating the specialized motor programs that cause voluntary movements. As I remarked earlier, this may present an "insuperable" difficulty for some scientists of materialist bent, *but the fact remains, and is demonstrated by research, that non-material mind acts on material brain* (1985, pp. 61–62,85–86).

Eccles and Robinson discussed the research of three groups of scientists (Robert Porter and Cobie Brinkman, Nils Lassen and Per Roland, and Hans Kornhüber and Luder Deecke), all of whom produced startling and undeniable evidence that *a "mental intention" preceded an actual neuronal firing—thereby establishing that the mind is not the same thing as the brain, but is a separate entity altogether* (1984, pp. 156–164). As Eccles and Robinson concluded:

> But it is impressive that many of the samples of several hundred SMA nerve cells were firing probably about one-tenth of a second BEFORE the earliest discharge of the pyramidal cells down to the spinal cord…. Thus there is strong support for the hypothesis that the SMA is the sole recipient area of the brain for mental intentions that lead to voluntary movements (pp. 157,160).

Interestingly, Eccles was not the first to document this type of independence in regard to the mind's action on the brain, as he himself conceded:

> Remarkable series of experiments in the last few years have transformed our understanding of the cerebral events concerned with the initiation of a voluntary movement. It can now be stated that the first brain reactions cause by the INTENTION TO MOVE are in nerve cells of the SUPPLEMENTARY MOTOR AREA (SMA). It is right at the top of the brain, mostly on the medial surface. This area was recognized by the renowned neurosurgeon Wilder Penfield when he was stimulating the exposed human brain in the search for epileptic "foci" (regions of aberrant activity associated with epileptic seizures) (Eccles and Robinson, 1984, p. 156).

In 1961, Canadian neurosurgeon Wilder Penfield reported a dramatic demonstration of the reality of active mind at work. He observed *mind acting independently of the brain* under controlled experimental conditions that were reproducible at will (see Penfield, 1961; 1975; Custance, 1980, p. 19). Dr. Penfield's patient suffered from epilepsy, and had one hemisphere of his temporal lobe exposed from a previous surgery. Penfield reported:

> When the neurosurgeon applies an electrode to the motor area of the patient's cerebral cortex causing the opposite hand to move, and when he asks the patient why he moved the hand, the response is: "I didn't do it. You made me do it" ….It may be said that the patient thinks of himself as having an existence separate from his body. Once when I warned a patient of my intention to stimulate the motor area of the cortex, and challenged him to keep his hand from moving when the electrode was applied, he seized it with the other hand and struggled to hold it still. Thus one hand, under the control of the right hemisphere driven by an electrode, and the other hand, which he controlled through the left hemisphere, were caused to struggle against each other. *Behind the "brain action" of one hemisphere was the patient's mind*. Behind the action of the other hemisphere was the electrode (as quoted in Koestler, 1967, pp. 203–204).

Penfield went on to conclude: "But what is it that calls upon these mechanisms, choosing one rather than another? Is it another mechanism or is there in the mind something of different essence? To declare that these two are one does not make them so. But it does block the progress of research" (p. 204). Upon closing his surgical practice, Dr. Penfield wrote:

> Throughout my own scientific career, I, like the other scientists, have struggled to prove that the brain accounts for the mind. But now, perhaps, the time has come when we may profitably consider the evidence as it stands, and ask the question: Do brain-mechanisms account for the mind? *Can the mind be explained by what is now known about the brain? If not, which is more reasonable of the two possible hypotheses: that man's being is based on one element, or on two?* (1975, p. xiii).

Penfield's final observations caused him to reflect as follows:

> This is the correct scientific approach for a neurophysiologist: to try to prove that the brain explains the mind and that mind is no more than a function of the brain. But during this time of analysis, *I found no suggestion of action by a brain-mind mechanism that accounts for mind-action*….
>
> In the end I conclude that there is *no good evidence*, in spite of new methods, such as the employment of stimulating electrodes, the study of conscious patients, and the analysis of epileptic attacks, *that the brain alone can carry out the work that the mind does. I conclude that it is easier to rationalize man's being on the basis of two elements than on the basis of one* (1975, pp. 104,114).

These are the words of a man who studied the brain for decades, and who collected and analyzed the data first-hand. Penfield (1975) concluded that the mind might very well be "*a distinct and different essence*" (p. 62). We agree wholeheartedly. A.O. Gomes wrote:

> …[R]esearch is frequently conducted as if the whole occurrences under study were ultimately nothing more than the transformations of some physiological events into others; the mental phenomena involved are either ignored or given only a secondary importance…. How can physical sense receptors affect sense? *How can a reaction in the brain condition a reaction in the mind?* How can the (often quoted!) "enchanted loom" of nerve impulses in the brain, which always weaves meaningful, but never abiding, patterns—how can this "loom" evoke such rich mental experiences as the vision of everything we see, all the sounds we hear, all the bodily sensations we may ever become aware of? (1965, p. 448,446).

In the book containing the Nobel laureate conversations on these matters, Cousins commented: "*The question naturally arises: where do mental intentions come from, what is their source, their origin?*" (1985, pp. 66–67). These "mental intentions" are truly important, as Tattersall admitted when he wrote: "Everybody can agree that a major aspect of consciousness is the ability to form intentions; and nobody will dispute that human beings spend much of their lives in this activity, however hollow those intentions may eventually turn out to be" (2002, p. 58). So how did Eccles answer the question of where these mental intentions originate? He responded: "In contrast to these materialist or parallelist theories are the dualist-interaction theories. *The essential feature of these theories is that mind and brain are independent entities*…" (Eccles and Robinson, 1984, p. 35). By way of summary, here is Dr. Eccles' view:

> The self-conscious mind is actively engaged in reading out from the multitude of active centers at the highest level of brain activity, namely, the liaison modules that are largely in the dominant cerebral hemisphere. The self-conscious mind selects from these modules according to attention and interest, and from moment to moment integrates its selection to give unity even to the most transient experiences. Furthermore, the self-conscious mind acts upon these neural centers modifying the dynamic spatiotemporal patterns of the neural events. *Thus it is proposed that the self-conscious mind exercises a superior interpretative and controlling role upon the neural events*…. The present

> hypothesis regards the neuronal machinery as a multiplex of radiating and receiving structures: *the experienced unity comes, not from a neurophysiological synthesis, but from the proposed integrating character of the self-conscious mind* (1982, pp. 244–245).

It was the concept of the "self-conscious mind" to which Dr. Eccles devoted his life's research, and on which he spoke and wrote so often. In his invited lecture at the 1975 Nobel Conference, he reminded his fellow Nobel laureates:

> There is the continual experience that the self-conscious mind can EFFECTIVELY act on the brain events. This is most overtly seen in voluntary action, but throughout our waking life we are deliberately evoking brain events when we try to recall a memory or to recapture a word or phrase or to express a thought or to establish a new memory.... This hypothesis gives a prime role to the action of the self-conscious mind, an action of choice and searching and discovering and integrating.... A KEY COMPONENT OF THE HYPOTHESIS IS THAT THE UNITY OF CONSCIOUS EXPERIENCE IS PROVIDED BY THE SELF-CONSCIOUS MIND AND NOT BY THE NEURAL MACHINERY OF THE LIAISON AREAS OF THE CEREBRAL HEMISPHERE.... Furthermore, THE ACTIVE ROLE OF THE SELF-CONSCIOUS MIND IS EXTENDED IN OUR HYPOTHESIS TO EFFECT CHANGES IN THE NEURONAL EVENTS. Thus not only does it read out selectively from the on-going activities of the neuronal machinery, but IT ALSO MODIFIES THESE ACTIVITIES (1977, pp 81,82,83).

Eccles concluded by saying:

> *There must be a partial independence of the self-conscious mind from the brain events with which it interacts*. For example, if a decision is to be freely made it must be initiated in the self-conscious mind and then communicated to the brain for executive action. This sequence is even more necessary in the exercise of creative imagination, where FLASHES OF INSIGHT BECOME EXPRESSIONS BY TRIGGERING APPROPRIATE BRAIN ACTIONS (p. 87).

How would Dr. Eccles categorize himself? He certainly does not fit the description of a monist-materialist. Is he then a strict dualist? Does he consider himself a vitalist? What position does he take as a result of his fascinating, Nobel Prize-winning discoveries? In his book, *The Human Mystery*, he quelled any suspicions.

> If I should be asked to express my philosophical position, I would have to admit that I am an animist on Monod's definition. As a dualist I believe in the reality of the world of mind or spirit as well as in the reality of the material world. Furthermore I am a finalist in the sense of believing that there is some Design in the processes of biological evolution that has eventually led to us self-conscious beings with our unique individuality; and we are able to contemplate and we can attempt to understand the grandeur and wonder of nature, as I will attempt to do in these lectures. (1979, pp. 9–10).

Eventually, Sir John came to refer to himself as a "dualist-interactionist" (as did Sir Karl Popper). Eccles admitted:

> *As a dualist-interactionist, I believe that my experienced uniqueness lies not in the uniqueness of my brain, but in my psyche*. It is built up from the tissue of memories of the most intimate kind from my earliest recollection onwards to the present.... It is important to disclaim a solipsistic solution of the uniqueness of the self. Our direct experiences are of course subjective, being derived solely from our brain and self. The existences of other selves ARE ESTABLISHED by intersubjective communication (1992, p. 237).

Popper and Eccles presented their views in 1977. In his portion of that volume, Popper wrote:

> *But the human consciousness of self transcends, I suggest, all purely biological thought*.... [O]nly a human being capable of speech can reflect upon himself. I think that every organism has a programme. *But I also think that only a human being can be conscious of parts of this programme, and revise them critically* (Popper and Eccles, 1977, p. 144).

Four years before that book's publication, Eccles went on record as stating:

> I was a dualist, now I am a TRIALIST! Cartesian dualism has become unfashionable with many people. They embrace monism in order to escape the enigma of brain-mind interaction with its perplexing problems. But Sir Karl Popper and I are interactionists, and what is more, TRIALIST INTERACTIONISTS! (1973, p. 189).

[NOTE: The term "trialist" as employed by Dr. Eccles is not to be confused with the word "trialism" that John Cottingham uses in his attempt to provide what he believes is "a more realistic category" in which to put animals—as creatures that have extension and sensation, but not thought (see Carter, 2002).]

Popper (1977) discussed his view (shared by Eccles) that reality should be seen as having three different aspects, which he subsequently labeled as World I, World II, and World III. World I is the objective world of *physical entities*. World II is the subjective psychic *inner reality* of each human being. World III is the world of *human culture* (i.e., the world of ideas). Popper and Eccles both agreed that "*the self-conscious mind is an independent entity to be superimposed upon the neural machinery*"—a superimposition that can lead to a variety of interactions in the brain as it moves between Worlds I, II, and III. Continuous subjective interactions exist between World I and World II, as well as cultural interactions affecting both World I and World II.

Dr. Eccles performed numerous experiments in which nerve cells in the SMA discharged—solely as a result of mental intention—*before* the cells responsible for motor activity. He discussed on numerous occasions the scientific evidence substantiating that the mind is a separate entity from the brain—evidence that he had gathered through a lifetime of study on the brain-mind problem (see Eccles, 1973; 1979; 1982; 1984; 1989; 1992; 1994). Eccles stated: "*We are a combination of two things or entities: our brains on the one hand, and our conscious selves on the other*" (1984, p. 33).

Could Popper and Eccles be onto something here? Could there be a "world," within each human, containing a "psychic inner reality"? Jay Tolson used humans' ability to employ symbolic language (in a way that no animal can) to inquire about "a person beneath the personality."

> Using language at its most refined limit—irony—shows how we often mean something more or other than what we say. *Might that not be a tantalizing glimpse of a self beyond the mere representation of the self, a person beneath the personality? A ghost in the machine, after all?* (2002, p. 46).

Paul Davies was constrained to ask:

> Can the mind somehow reach into the physical world of electrons and atoms, brain cells and nerves, and create electrical forces? Does mind really act on matter in defiance of the fundamental principles of physics? ARE THERE, INDEED, TWO CAUSES OF MOVEMENT IN THE MATERIAL WORLD: ONE DUE TO ORDINARY PHYSICAL PROCESSES AND THE OTHER DUE TO MENTAL PROCESSES?… The only minds of which we have direct experience are those associated with brains (and arguably computers). Yet nobody seriously suggests that God, or departed souls, have a brain. DOES THE NOTION OF A DISEMBODIED MIND, LET ALONE A MIND COMPLETELY DECOUPLED FROM THE PHYSICAL UNIVERSE, MAKE ANY SENSE (1983, pp. 75,72).

While the committed monist-materialist would answer "no" to every one of Dr. Davies' questions, our research answers "yes" to each of them. With the available scientific evidence (from reputable scientists such as Penfield, Eccles, and others) which documents that mind *does* interact with matter (the brain), what other conclusion could one possibly reach? As Eccles put it:

> These considerations lead me to the alternative hypothesis of dualist-interactionism. *It is really the commonsense view, namely that we are a combination of two things or entities: our brains on the one hand; and our conscious selves on the other* (1982, pp. 88).

Feigl admitted:

> Vitalists or interactionists…hold that biological concepts and laws are not reducible to the laws of physics, and hence—*a fortiori*—that psychological concepts and laws are likewise irreducible…. The upshot of this longish discussion on the difference between the scientific and the philosophical components of the mind-body problem is this: *If interactionism or any genuine emergence hypotheses are sensibly formulated, they have empirical content and entail incisive limitations of the scope of physical determinism* (1967, pp. 7,18).

Then, not long after Feigl wrote that interactionism hypotheses, if "sensibly formulated," could have "empirical content," Sir John Eccles came along and "sensibly formulated" his dualist-interactionist theory—and then provided the "empirical content" to go along with it. And where does such "empirical content" lead? Davies inquired: "Does the notion of a disembodied mind, let alone a mind completely decoupled from the physical universe, make any sense?" We respond that it most certainly does. Eccles, Penfield, and others have shown conclusively that *mind exists independently of matter*.

The thought, then, of a "universal mind" that stands behind this Universe no longer sounds quite so far-fetched. In fact, George Wald addressed this very theme.

> I had already for some time taken it as a foregone conclusion that the mind—consciousness—could not be located. It is essentially absurd to think of locating a phenomenon that yields no physical signals, the presence or absence of which, outside of humans their like, cannot be identified.
>
> But further than that, mind is not only not locatable, it *has no location*. It is not a *thing* in space and time, not measurable; hence, as I said at the beginning of this chapter, not assimilable as science. And yet it is not to be dismissed as an epiphenomenon: it is the foundation, the condition that makes science possible….
>
> A few years ago it occurred to me that these seemingly very disparate problems might be brought together. And this could happen through the hypothesis that *mind*, rather than being a very late development in the evolution of living things, restricted to organisms with the most complex nervous systems—all of which I had believe to be true—*has been there always. And that this universe is life-breeding because the pervasive presence of mind had guided it to be so* (1994, pp. 128,129).

Dr. Wald is in good company in sensing what he called "the pervasive presence of mind." The late, distinguished astronomer from Great Britain, Sir Arthur Eddington, admitted: "The idea of a universal mind, or Logos, would be, I think, a fairly plausible inference from the present state of scientific theory" (as quoted in Heeren, 1995, p. 233). Physicist Sir James Jeans wrote:

> Today there is a wide measure of agreement which on

> the physical side of science approaches almost unanimity, that the stream of knowledge is heading towards a non-mechanical reality: the Universe begins to look more like a great thought than a great machine. *Mind no longer looks like an accidental intruder into the realm of matter; we are beginning to suspect that we ought rather to hail it as the Creator and governor of the realm of matter*.... We discover that the Universe shows evidence of a designing or controlling Power that has something in common with our own minds (1930).

George Stanciu asked:

> What cause is responsible for the origin of the genetic code and directs it to produce animal and plant species? It cannot be matter because of itself matter has no inclination to these forms, any more than it has to the form Poseidon or the form of a microchip or any other artifact. *There must be a cause apart from matter that is able to shape and direct matter. Is there anything in our experience like this? Yes, there is: our own minds*. The statue's form originates in the mind of the artist, who then subsequently shapes matter, in the appropriate way.... *For the same reasons there must be a mind that directs and shapes matter in organic forms* (1987, p. 191).

Or, to quote Robert Jastrow: "That there are what I, or anyone would call supernatural forces at work is now, I think, a scientifically proven fact" (1982, p. 18).

Freeman Dyson noted:

> The mind, I believe, exists in some very real sense in the universe. But is it primary or an accidental consequence of something else? The prevailing view among biologists seems to be that the mind arose accidentally out of molecules of DNA or something. I find that very unlikely. *It seems more reasonable to think that mind was a primary part of nature from the beginning and we are simply manifestations of it at the present stage of history* (1988, p. 72).

John Beloff (1994) made a startling admission.

> The fact is that, leaving aside mythical and religious cosmologies, the position of mind in nature remains a total mystery. *It could be that there exists some sort of a cosmic mind*, perhaps co-equal with the material universe itself, *from which each of our individual minds stems and to which each ultimately returns*. All we can say is that it looks as if a fragment of mind-stuff becomes attached to an individual organism, at or near birth, and thereafter persists with this symbiotic relationship until that organism perishes.

Then, with an even bolder tact, Arne Wyller dared to ask: "*What if there existed a mind before people*...perhaps a consciousness we will one day find in another part of the Universe, perhaps a universal consciousness field: *The Planetary Mind*" (1996, p. 223).

Just think. "What if" there existed a mind before people—a "universal/planetary/cosmic Mind Who could "attach a fragment of mind-stuff" to an individual organism at birth? Just think! As Richard Heinberg (1994) remarked:

> But at least the spiritual view leaves open the door for the possibility that our explanations for biological phenomena are still incomplete in some fundamental way. To prematurely close that door might be a profound error. If we think we have essentially the whole picture of what life is and how it works, when in reality we have only a part of that picture; if our working philosophy systematically excludes certain kinds of evidence and certain kinds of explanations; and further, if we act on our philosophy in ways that have global repercussions, then could be getting ourselves into serious trouble indeed. A spiritual perspective, even in its weakest and most generalized form, would hold that *present material explanations for biological and psychological realities are necessary but not sufficient. Something else must be taken into account* (pp. 74–75).

Conclusion

That "something else" of which Heinberg wrote has intrigued almost everyone who has worked on the brain-mind problem—some to a greater degree than others. Sir Roger Penrose remarked:

> *It seems to me that there is a fundamental problem with the idea that mentality arises out of physicality*—that is something which philosophers worry about for very good reasons. The things we talk about in physics are matter, physical things, massive objects, particles, space, time, energy and so on. How could our feelings, our perception of redness, or of happiness have anything to do with physics? *I regard that as a mystery* (1997, p. 94).

So do thousands (maybe even millions!) of others. As Dennett admitted:

> It does seem as if the happenings that ARE my conscious thoughts and experiences cannot be brain happenings, but must be SOMETHING ELSE, or something cause or produced by brain happenings, no doubt, but something in addition, made of different stuff, located in a different space.... *Mind stuff...has some remarkable properties...but it is extremely resistant to definition*....
>
> Since we don't have the faintest idea (yet) what properties mind stuff has, we cannot even guess (yet) how it might be affected by physical processes emanating somehow from the brain, so let's...concentrate on the return signals, the directives from mind to brain. These, *ex hypothesi*, are not physical; they are not light waves or sound waves or cosmic rays or streams of subatomic particles. No physical energy or mass is associated with

> them. How, then, do they get to make a difference to what happens in the brain cells they must affect, if the mind is to have any influence over the body?… How can mind stuff *both* elude all physical measurements and control the body? (1991, pp. 27,28,34,35).

Good questions—which monistic materialists like Dennett cannot answer.

One thing is certain, however: the *fact* of our self-awareness—of our consciousness—is both self-evident and undeniable. The belief in an "inner self," a "personal psyche," or a "soul" is well nigh universal. Dennett also noted:

> The idea that a SELF (or a person, or, for that matter, a soul) is distinct from a brain or a body is deeply rooted in our ways of speaking, and hence in our ways of thinking.… *It is quite natural to think of "the self and its brain" as two distinct things*, with different properties, no matter how closely they depend on each other. If the self is distinct from the brain, it seems that it must be made of mind stuff. In Latin, a thinking thing is *res cogitans*…. So the conscious mind is not just the place where the witnessed color and smells are, and not just the thinking thing. It is where the appreciating happens. It is the ultimate arbiter of why anything matters. Perhaps this even follows somehow from the fact that the conscious mind is also supposed to be the source of our intentional actions (1991, pp. 29,31).

Jerome Elbert wrote in agreement: "The soul belief is so basic in our culture that, through ordinary communications, most of us come to believe that a network of neurons cannot, by itself, generate our thoughts and awareness of the world" (2000, p. 217).

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