

ISSUE 1



Are Mind and Brain the Same?

YES: Paul C. L. Tang, from "A Review Essay: Recent Literature on Cognitive Science," *Social Science Journal* (1999)

NO: Jon Mills, from "Five Dangers of Materialism," *Genetic, Social & General Psychology Monographs* (February 2002)

ISSUE SUMMARY

YES: Philosophy professor Paul C. L. Tang explains the argument that anything usually attributed to the mind is only brain activity by describing the position of Paul Churchland, a leader in the field of cognitive science.

NO: Researcher Jon Mills points out five dangers of dismissing a concept of mind, such as the elimination of free will and a sense of self, and instead proposes a psychic holism.

Do you think your sense of *self* is something different or separate from your body? For much of recorded history, that question was considered the domain of philosophers and theologians. When psychology was established as the science of mental activities and behaviors, those questions about the existence and workings of the mind, and how the mind related to the brain and the rest of the body, were critical. A quick look at the history of psychology will reveal how this debate has evolved.

As each theory or heuristic in psychology grew in popularity, a different view of the mind/body and mind/brain dilemma emerged. Freud focused much of his work on the mind, particularly the unconscious. Following the popularity of Psychoanalytic Theory came Behaviorism. Under the influence of Watson and Skinner, the field of psychology turned totally to the physical, measurable aspects of behavior. At that point in time the concept of the mind had no place in psychology. Then, in the late 1950s, psychology experienced the Cognitive Revolution. Suddenly, it was acceptable to discuss some less behavioral aspects of human life such as memory, language development, reasoning, and cognitive development. The debate

between dualism (two separate parts, mind and brain) and monism (one unified part, and in this case, brain only) began to rage again.

Today this mind/brain issue is passionately debated by the psychologists, computer scientists, neuroscientists, and philosophers who make up the new interdisciplinary field of cognitive science. Many cognitive scientists assume a monistic position that everything once thought to be mental is actually nothing more than brain activity. This is the focus of the first selection, the position of Paul Churchland as explored by Tang. Neuroscientists are learning a great deal about how the brain activates and controls the processes of chemically storing memories and initiating emotions. Another area of support for this position comes from the complex *mental* work being done by computers. Could it be that our brains operate in the same way as high-powered computers?

There are philosophers and psychologists who react against this monist position, arguing that the concept of mind is useful and even necessary. In the second selection, Mills explores the dangers of discarding the concept or theory of mind. Mills uses some philosophical terms that may be new to you. One of those terms is *ontology*, which refers to a specific way of explaining the existence of something. Mills argues that reducing everything mental to brain activity takes away any possibility of an ontology of consciousness—it rejects any way of conceptualizing consciousness as something with its own unique existence and properties. Mills uses the term *teleology* when discussing free will. Teleology refers to actions or thoughts that have a purpose and that are designed to reach an end state. Mills believes that rejecting the concept of mind reduces human beings to behavioral objects, totally controlled by outside forces, and lacking any free will. Could it be that discounting the mind is a step backwards for the field of psychology?

In the first selection, professor Paul Tang will explore the arguments of Paul Churchland in support of the perspective that all mental processes are simply the experience of brain activity. The second selection summarizes the counterargument of researcher Jon Mills. He points out the dangers in this line of reasoning and provides an alternative with his notion of psychic holism. Consider these arguments carefully as you try to determine your personal position.





Paul C. L. Tang

A Review Essay: Recent Literature on Cognitive Science

... Paul Churchland is a very distinguished analytic philosopher, philosopher of science, and philosopher of cognitive science. He is a leading proponent of the philosophical doctrine of *eliminative materialism*, which claims, among other things, that mental processes or mental states (e.g., believing) as traditionally conceived do not exist. He maintains that advances in the neurosciences and artificial intelligence hold the key to understanding cognition. Churchland is widely regarded as a leader in the fields of philosophy of mind (also called "philosophical psychology"), philosophy of science, epistemology, philosophy of perception, and philosophy of cognitive science. Moreover, he is also a leading defender of the philosophical doctrine of scientific realism, which, on one common definition, claims that our scientific theories give us a literally true account of the world, especially of the unobservable world. In his book, *Matter and Consciousness*, several philosophical themes have emerged, some of them controversial.

Eliminative Materialism

The French philosopher, René Descartes (1596–1650), often called "The Father of Modern Philosophy," posed the metaphysical mind/body problem in its sharpest form. Descartes asked: What do human beings have that material objects do not have that allows human beings to cognize, to learn languages, and to learn mathematics? He argued that human beings must have an immaterial, non-spatial mind over and above a material, spatially located brain that inanimate objects and lower life forms do not have. Descartes called this mind "mental substance," the essence of which is thinking. Mental substance, Descartes argued, is to be contrasted with material substance, the essence of which is extension, the occupying of space. These two, radically distinct substances are the basis of Descartes' metaphysical dualism. (For Descartes, there was also a third substance, viz., Divine Substance or God.) These substances have necessary existence and need nothing else for their existence. For Descartes, the separation of material substance from mental substance meant that science (that deals with material substance) would

never have to come into conflict with religion (that deals with mental substance, or spirit, or soul). Nevertheless, a problem immediately arose as to the nature of the causal interaction between an immaterial, non-spatial mind and a material, spatial body. Descartes held that this interaction occurred in the pineal gland, but this answer simply postpones the problem rather than solving it. To this day, there is no generally received answer to this mind/body problem from philosophers, or psychologists, or neuroscientists.

Although few scholars would hold Descartes' theory of substance dualism today, there are, nevertheless, many varieties of contemporary dualism. . . .

[One of] these dualistic theories, *reductive materialism*, more often called "the identity theory," holds that mental states are physical states of the brain. An even more popular materialist theory is *functionalism*, which holds that the defining feature of any type of mental state is the set of causal relations it bears to environmental effects on the body; to other types of mental states; and to bodily behavior. So pain, for example, typically results from bodily injury; causes annoyance and distress; and causes wincing, blanching and the nursing of the injured area. Any state that plays exactly the same functional role is a pain, according to functionalism. A third type of materialism is *eliminative materialism*, which holds that our theory of mental states is impoverished, if not simply incorrect. For eliminative materialists, there are no mental states; only brain states.

Eliminative materialism is the philosophical theory of mind/brain that Churchland holds. He argues that it is a position well supported by advances in the neurosciences. . . . [A]dditional support for eliminative materialism is gained by studying cases of brain damage, degeneration, and disequilibrium. For example, lesions to the connections between the secondary visual cortex and the secondary auditory cortex of the left hemisphere may result in the inability to identify perceived colors, whereas lesions to the secondary auditory cortex of the left hemisphere results in the more drastic effect of total and permanent loss of speech comprehension, whereas bilateral damage to the hippocampus results in the inability to lay down new memories.

Nevertheless, eliminative materialists, such as Churchland, must still account for the phenomenon of introspection and the "qualitative feel" of our alleged mental states. The eliminative materialist must account for the difference we claim to perceive between pain, for example, and our understanding of a mathematical problem or our believing or knowing a fact. A strong case can be made that these latter phenomena are best explained under some dualist theory of mind/brain.

Scientific Realism

The argument from introspection in favor of a dualism of mind/brain is a serious problem for Churchland. He responds to it by invoking a robust scientific realism, which is, basically, the position that our scientific theories give us a literally true account of the world. Moreover, Churchland claims

that, if our scientific theories are successful at explaining and predicting phenomena, then we have very good reason to believe that the entities that the theories postulate really exist, even if they are not directly sense perceivable. For example, the Standard Model Theory of Matter claims that electrons, protons, quarks and other subatomic entities exist even if we do not directly perceive them with our five senses. As Churchland argues, when we experience a warm summer day as 70° Fahrenheit, what we are experiencing is the mean kinetic energy of the air molecules, which is about 6.2×10^{-21} joules, whether we realize it or not. For heat is mean kinetic energy of molecules. And if we don't perceive it that way, we can learn to do so.

Realism is important for Churchland, for it allows him to formulate a response to the argument from introspection, the strongest argument against the eliminative materialism that Churchland embraces. Churchland argues that, with suitable training and knowledge, one can eventually introspect directly his or her own brain states. This claim, if successfully argued both conceptually and empirically, would undercut the dualist position that one introspects one's mental states that exist over and above the brain. But this leads to one of the most controversial of Churchland's theses, for he would then claim that eventually we could directly introspect such brain states as spiking frequencies in specific neural pathways and dopamine levels in the limbic system, as based on a realist account of our most current and successful neurophysiological theories.

To support this controversial claim—concerning direct introspection of our brain states—Churchland asks us to consider the case of the musical prodigy who, at a very early age, can distinguish between for example, sound pitches. Very soon, with more training and study, he can distinguish between different instruments of the orchestra and as he matures into a talented young conductor, he can distinguish when instruments in an orchestra are playing in tune and when they are not. And so on. Churchland then analogizes with the introspection of brain states. He claims that we will have to learn the conceptual framework of a matured neuroscience if we are to introspect brain states directly and that we will have to practice its non-inferential application. Eventually we will reach the stage analogous to that of the mature conductor who can now directly experience phenomena that he could not experience at an earlier stage of his development. Churchland holds that the amount of self-apprehension gained by such direct introspection of brain states will be more than worth the effort of the training and study. . . .

Neural Nets

As an eliminative materialist, Churchland is quick to use parallel distributive processing (PDP) or neural nets from artificial intelligence (AI) research as a model of cognitive processes. Such digital computers function solely as symbol manipulators and it is unclear whether any symbol manipulator—whether computer or human being—can ever possess intentionality, the state of having meanings that point to, or are about

features of the world. Typically, intentionality is said to be "the mark of the mental." The philosopher John Searle argues that mere symbol manipulators cannot have semantics or meanings and thus intentionality. Thus, on the computational model of conscious intelligence that Churchland holds, Searle argues that a brain that simply manipulates symbols cannot account for people having meanings that are about the world. But as many philosophers hold, a dualist theory of mind/brain can. Meanings (or propositions) are just the objects of mental states.

Searle uses his famous "Chinese Room Argument" (of which there are several versions) to argue his case. Suppose Searle himself is the central processing unit (CPU) of a digital computer and understands no Chinese at all. If Searle is given rules of syntax, he can string together Chinese characters and output them in such a way that a person fluent in Chinese could read the outputted string of symbols, understand, and respond. But, he, Searle, cannot so respond even though as a CPU he gives the appearance of knowing what the symbols mean. Searle argues that the meaning of the symbols have intentionality, that they are about the world and hence the Chinese speaker can understand and respond appropriately to the output sentence in a way that Searle as a mere symbol manipulator cannot. So brains or computers, which can only manipulate symbols according to a program, cannot have intentionality. Intentionality can be had only by objects that have a conscious mind, such as the Chinese speaker. Searle claims that his argument will hold independently of technological advances, however great, in computer design. Searle's argument presents a serious challenge to Churchland's eliminative materialism and the associated view that the material brain is just a neurocomputer.

Churchland counters Searle's argument with his own "luminous room argument." Churchland asks us to imagine a small, closed off room that is literally dark. The occupant in this room is the scientist James Clerk Maxwell, who claims that light is nothing other than electromagnetic waves. Maxwell shakes a bar magnet that produces such waves. An outside critic points out that the room is completely dark, so light could not possibly be electromagnetic waves. Churchland says that all Maxwell needs to do is claim that the room is indeed lit, albeit at a grade too poor to be detected. All that is needed for visible light is that the electromagnetic waves be speeded up to produce visible light. Similarly with Searle's argument, claims Churchland. All that is needed is that the syntax of a language be sufficiently complex in order for us to detect the meaning and thus the intentionality of symbol manipulation. . . .

The Brain as the Engine of Reason and the Seat of the Soul

Churchland's *Matter and Consciousness* is introductory and repays close study. He gives a balanced view of all sides of a topic. However, in *The Engine of Reason, the Seat of the Soul*, Churchland takes a firm stand on his own position of eliminative materialism and his other positions as well. For example,

he argues strongly that the neurosciences and AI research have recently contributed, and will continue to contribute to a greater understanding of the brain and of cognitive processes. In addition, contrary to what many philosophers and theologians have held over the years, there is no "mind" or "spirit" or "soul" over and above the brain. The brain is the self.

This Churchlandian position runs counter to the classical position known as "mind/body dualism." The mind is the origin of thought ("the engine of reason") as well as "the seat of the soul." For Descartes, the mind causally interacts with the brain, although this interaction is difficult to explain. Modern dualists have not been successful either, and this problem has led many philosophers, psychologists and cognitive scientists in general (who may be neuroanatomists, neurochemists, AI researchers, scientifically trained philosophers) to argue for materialism, the view that denies there is such an entity called "the mind" and claims that there is only one entity, the material brain.

Moreover, Churchland argues that all cognitive processes can be explained entirely in terms of the brain. This revolutionary treatment of cognition and ultimately of the self will also result in reconceptions of consciousness, philosophy, science, society, language, politics and art. Finally, the technology that could arise from this neural net approach to brain function could have important medical and legal consequences, claims Churchland.

As discussed previously, Churchland specifically holds the position of eliminative materialism, a position he claims is also supported by studies on brain damaged and brain lesioned patients or on, for example, Alzheimer's patients. Postmortem examinations of the brains of Alzheimer's victims reveal material plaques and tangles throughout the fine web of synaptic connections of the neurons of the brain that embodies all of one's cognitive skills and capacities for recognition.

Moreover, Churchland is impressed with the tremendous advances in the neurosciences and in AI research that allows for the modeling of brain processes. These advances allow cognitive scientists to represent brain function as massively parallel distributive processing (PDP) of recurrent neural nets that carry out vector to vector transformations or vector completions (see below). This new model (perhaps theory) of human cognitive brain processes will effect, Churchland claims, a revolution in our understanding of the self, of consciousness, of all cognitive processes, of science, of art, and of much else besides. Churchland's book, *The Engine of Reason, the Seat of the Soul* is intended to convey the possibilities and excitement of this revolution. . . .

Consciousness

In his work, Churchland deals with the fascinating but difficult puzzle of consciousness. This phenomenon seems unique to human beings and beyond scientific and purely physical explanation. Traditionally, philosophers have argued that the phenomenon is basically a subjective occurrence, accessible only to the creature that has it. Churchland argues against this classical view.

Churchland begins by reviewing a number of similar arguments for the classical view advanced by such philosophers as Gottfried Leibniz (1646-1716) and the contemporary philosophers Thomas Nagel, John Searle, and Frank Jackson. Nagel's argument is perhaps the most familiar and was advanced in his seminal paper, "What is It Like to Be a Bat?" Nagel argues that no matter how much one might know about the neuroanatomy of a bat's brain and the neurophysiology of a bat's sensory apparatus, one will never know "what it would be like" to have the bat's sensory experience. Even if scientists could track the neuroactivation patterns, one would never know what they are like from the unique perspective of the creature that possesses them; that is, their intrinsic character as felt experiences would still be unknown to us. A purely physical science of the brain, Nagel and others argue, does have a limit on the capacity of understanding as it reaches the subjective character of the contents of one's consciousness.

Churchland responds by arguing that Nagel fails to make a distinction between how one knows something and the thing known. Churchland argues that the existence of a unique first-person epistemological access to a conscious phenomenon does not entail that the phenomenon is nonphysical in character. For example, the difference between X's knowledge of her facial blush and Y's knowledge of X's facial blush lies not in the thing known but rather in the manner of knowing it. The blush itself is a physical entity.

Churchland then proposes seven provisional criteria of adequacy that a neuroscientific theory of consciousness must try to reconstruct. Consciousness (1) involves short-term memory; (2) is independent of sensory inputs; (3) displays steerable attention; (4) has the capacity for alternative interpretations of complex or ambiguous facts; (5) disappears in deep sleep; (6) reappears in dreaming; (7) holds the contents of several basic sensory modalities within a single, unified experience. . . .

Concluding Remarks

Churchland's position that all cognitive processes and the phenomenon of consciousness can be reduced to brain processes representable as a testable theory of recurrent neural nets is a powerful and carefully argued position. He is at pains to warn the reader several times that he may be wrong. Indeed, there will continue to be strong arguments raised against his position and it is too soon to say whether his approach will triumph. . . .

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Jon Mills



Five Dangers of Materialism

Contemporary theories in cognitive science and the philosophy of mind lend burgeoning support to the materialist position regarding the mind-body problem. That is, naturalism, physicalism, and material monism are the preferred theories that explain the relationship between mental processes and physical brain states. Although dualist and spiritualist approaches offer counter-arguments to materialism (Vendler, 1994; Warner, 1994), the preponderance of current research in the philosophical, natural, and social sciences concludes that mental states are nothing but physical states (Armstrong, 1968; Bickle, 1998; Churchland, 1981; Dennett, 1991; Dretske, 1995; Searle, 1994). From these accounts, *mind is brain*.

Throughout this article, I highlight five central dangers associated with materialism that ultimately result in (a) the displacement of an ontology of consciousness, (b) a simplistic and fallacious view of causality, (c) the loss of free will, (d) renunciation of the self, and (e) questionable judgments concerning social valuation practices. I attempt to demonstrate that the physicalist position eliminates the possibility of free agency and fails to adequately account for psychic holism.

The Spectrum of Materialism

One thing is clear about materialism: It is a reaction against and rejection of Cartesian dualism that posits a non-extended "thinking substance" associated with an immaterial mind (Descartes, 1641/1984). It is worth noting, however, that there are many forms of dualism, including the Platonic distinction between appearance and reality; Kant's separation of phenomena from noumena; the ontological distinctions between being and essence; the dialectically opposed forces and manifestations of consciousness; and the epistemological chasms between the knowing subject and object. It is not my intention to defend ontological dualism, but to show that materialist conceptions of mind pose many problems for those trying to understand the complex psychological, psychosocial, and ontological configurations that constitute the human condition.

Rather than explicate the multitude of materialist positions ranging from identity theories (Armstrong, 1968; Lewis, 1966; Place, 1956),

functionalism (Levin, 1986; Putnam, 1967; Smart, 1962; Sober, 1985), supervenience (Teller, 1983), eliminativism (Churchland, 1981; Stich, 1994), and representationalism (Dretske, 1988, 1995; Fodor, 1987, 1998), to anomalous monism (Davidson, 1980), I refer collectively to the materialist position, which includes the following characteristics as operationally defined:

1. *Physical reductionism*, which holds that (a) all mental states are simply physical states in the brain; there is nothing "over and above" biological-neurochemical-physiological structures, processes, and evolutionary pressures; (b) all mental events, properties, and processes arise out of physical preconditions whereby (c) the organism is conceived of as a matter-energy system composed solely of active material properties or substances reified through material-efficient causal attributions.
2. *Naturalism*, as I define it, (a) is the belief that all knowledge comes from physical conditions governed by natural causal laws based on an empirical epistemology; (b) supports realism, which is often (but not always) incompatible with a priori truths or transcendental idealist positions; (c) is a form of positivism, in that truth claims about reality are quantifiable facts that can be directly observed, measured, or verified within systematic science relying on experience, experimentation, and rational methods of inquiry; (d) is anti-supernaturalistic, anti-theological, and anti-metaphysical (despite its metaphysical consequences); (e) is pro-scientific—that is, all natural phenomena are adequately explained, or in principle can be explained, through scientific methodology; and (f) displays tendencies toward non-teleological, non-anthropomorphic, and non-animistic explanations.

If materialism is going to make such ontological assertions, then it must be able to coherently defend its own self-imposed assumptions without begging the question. If we are going to properly understand the question of mind, we must ferret out the philosophical, humanistic, and ethical implications of the materialist project and expose the conundrums it generates. I attempt to show that psychic holism becomes an alternative paradigm to the materialist position and more successfully addresses the multifaceted domains of mental processes, personal experience, and discourse surrounding mind-body dependence without succumbing to a reductive metaphysics.

The Naturalistic Fallacy

Freud (1900) admonished us to "avoid the temptation to determine psychological locality in any anatomical fashion" (p. 536), insisting that the mind should not be reduced to "anatomical, chemical or physiological" properties (1916-1917, p. 21). Materialists, on the other hand, are dogmatic in their insistence that all mental events can ultimately be reduced to physical events or brain states in the organism. Thus, physical reductionism is the sine qua non of materialism. Teller (1983) summarized this

position nicely: "Everything . . . is at bottom physical." In other words, there is no mind, only brain. One might ask materialists, "How do you know that?" To justify their claims, they inevitably rely on science, empirical psychology, the bare appeal to sensible and tangible experience, and/or naturalized or evolutionary accounts of epistemology (see Quine, 1969; Vollmer, 1975; Wakelets, 1990). Science has its legitimate status; however, it must first establish a coherent criterion for truth. To fall back on the very criterion that it must set out to prove simply begs the question and envelops materialist justifications in circularity.

Putnam (1983) charged that naturalized epistemology presupposes a metaphysical realism and a correspondence theory of truth in that truth corresponds to the "facts." He ultimately argued that this notion is incoherent, whereby "truth" is relevant to one's scheme of describing and explaining physical phenomena, hence embedded in a social language practice that determines how truth is to be defined and measured. This metaphysical assumption postulates a set of "ultimate" objects that are "absolute" and can be "objectively" measured, hence are "real," essentially aiming to revive the whole failed enterprise of the realism-anti-realism debate. . . .

The Destruction of an Ontology of Consciousness

Materialist conceptions of mind are highly problematic for several reasons. First, the individual is reduced to physical substance alone, which gives rise to an organismic and, in some cases, mechanistic view of the human being. By reducing the psyche to matter, materialism displaces an ontology of consciousness. That is, there is no distinct ontological status to mental events; psychic processes and properties are merely physical properties within a functional system that constitutes the organism. The transcendental properties of the mental are reduced to atomic and subatomic particles within a closed system of energetics constituted through quantum mechanics. In this sense, mind does not direct consciousness or action, *mutter* does. In short, the human being is reduced to a thing—a refined biological machine engineered by evolution and stimulated by the environment.

This approach can lead to a very dehumanizing account of the individual. The intrinsic uniqueness of individuality, personality, and the phenomenology of psychical experience collapses in reductionism. By making the human being merely an organism, one has stripped the uniquely personal and idiosyncratic dimensions of selfhood down to biology. Although this ideology has its rudiments in natural science and evolutionary biology, from this standpoint consciousness does not exist, that is, consciousness, intentionality, the phenomenal experience, qualia, the "aboutness" or "what it's like" to experience something and to live are reduced to changes in brain states engulfed in a language describing physical processes alone. Within this context, all conscious experience and

behavior constitute a functional (and at times mechanical) operation that is organized within a systemic structure. The meaning of being human and the existential questions and dilemmas that populate mental life are abandoned to sterile scientific depictions of animate organic matter. Although materialist theories vary in conceptual depth and locution, in the end there is no metaphysical mind, only physical-energetic substance.

Simplicity and Causal Fallacies

Materialism ultimately rests on a simplistic view of causality—a view that is inherently biased and conforms to the empirical positivist tradition—namely, psychic reality is that which is directly observable, measurable, and quantifiable, thus constituted as fact. We owe this view to the law of parsimony, or Ockham's razor: The virtue of simplicity is intended to be in the service of economy; that is, anything intelligible can be explained in material terms. Abstract theories of complexity and ambiguity are less economical and do not neatly "fit" into ordinary belief systems; therefore, simplicity is preferred to complexity. However, the simplest explanation is not necessarily the most accurate. This position has been applied in the following way: "If one cannot observe it or measure it, it does not exist." In my view, the value of simplicity has been abused here. There is no value in reducing the human being to a thing. While the value of parsimony is appropriate for various types of social, professional, and pragmatic discourse, this view sacrifices the qualitative aspect of what it is like to be human. Cognitive science today is content with explaining consciousness as experiential changes in brain states that can in part be observed, measured, and quantifiably verified. Observation is one thing, but the generalized claim "That is all there is!" is epistemically problematic. This positivistic account presupposes a "God's eye" view of reality and thus makes a sweeping metaphysical judgment.

Materialism fallaciously posits that if psychic events are realized physically, then their tenets are proved. At the very least, materialists are obliged to take an agnostic position with regard to an ontology of consciousness. Just because one cannot directly observe or measure conscious phenomena does not mean that neurophysiology is all there is. As previously mentioned, this is a naturalistic or reductive fallacy. The very idea of the mental is that it is something that is not tangible, it is literally *no-thing*, hence psychical. This is not to deny the interdependence and interpenetration of mind and body: While physical processes and properties are necessary conditions of mind, they are far from being sufficient conditions to produce mind. Mind is embodied or instantiated physically, but by virtue of its transcendental and elusive functions and properties, it cannot be spatially localized or dissected. Most materialists want to eliminate this stance as a viable possibility and hold allegiance to a simple economy—that which is *real* is something that is tangible. This fixation with making metaphysical and epistemic pronouncements based on tangible evidence in the service of economy jeopardizes the integrity of psychical reality.

Another pitfall of the materialist position is the simplistic notion of causality as physical reduction. Thus, materialism relies on the interaction of two primary causal attributions: (a) physical causation and (b) environmental determinism. This position insists that the human being is, in Aristotelian terminology, the conglomeration of material and efficient causes: Mind is caused by the matter or physical substance it is made of and is causally affected by the material forces that constitute the flux of environmental events. This is the case for the most unrefined materialist positions ranging from the type-type identity theory to the more sophisticated functional monist approaches. It boils down to (a) the physical causing all mental events, thus instituting force and motion that bring about effects; and (b) environmental contingencies that cause the organism to respond to a stimulus prior to the effect in time. This is the theoretical foundation of most materialist theories as well as American behaviorism, which espouses the stimulus-response paradigm of psychological processes. In other words, some stimulus (whether internal or external) precedes a response (changes in brain states, neurochemical networks and patterns of activity, or behavioral output due to environmental variables), thereby causing physiological, cognitive, and behavioral changes in the organism. . . .

Loss of Freedom

Reliance on material and efficient causal explanations, the over-valuation of simplicity à la Ockham's razor, and consequently, physical reductionism, completely eliminate any possibility of free will. From this standpoint, the human being is not free. This position is summarized by the exclusion thesis, which posits that human beings have no properties or mental powers that no object or physical system can possess (Graham, 1993). Thus, if free will is a mental process or property, and no physical system is free, then we do not possess free choice and are consequently not free. This simplicity denies the possibility of final causal determinants and transcendental teleology characteristic of free agents. *Agent* is defined here as a subject who is teleic, purposeful, and self-directed via choices and deliberation in judgments constituting self-conscious activity. Therefore, thoughts, volitional intentions, and behaviors are the activities of the will: Freedom is ultimately defined as the ability to choose or *be* otherwise. Freedom, however, is not merely restricted to choice; it also encompasses the structural organization of the individual doing the choosing, namely the agent. In short, agency, free will, intentionality, and final causality (e.g., choosing the grounds for the sake of which to behave) are problematic for the materialist, for physical matter is caused rather than freely causal. . . .

Death of the Self

One of the most disturbing consequences of the materialist position is that the notion of the self dissolves. In the spirit of Nietzsche, "The Self is Dead!" and materialism killed it. Essentially, this view of the self is

commensurate with a Buddhist or Humean view—there is no self, only sensations and impressions impinging on the senses in a fleeting moment. For Hume, there is no "I" directing mentation. There is only the theater of the mind where thoughts are cast by natural laws and where self-reflection is only second-order perception. The self is merely an illusion. Thus, free will and any sense of personal identity are non-existent. In Dennett's (1991) words, we "*spin* a self," or as Skinner would contend, we are only operantly conditioned to believe in a self. The "I" is just a social construction or invention of language: We are a collection of dynamic mental properties and perceptions in flux, that's all.

Whether one conceives of the self in the tradition of Descartes's *cogito* as the "I" that resides behind the cognizer, the Kantian transcendental unity of apperception as the nominal, enduring, unified unifier; Hegel's notion of subjective spirit (*Geist*); Sartre's notion of the self as radical freedom; or the Freudian ego (*Ich*) as a self-directed synthesizing agent, the distinctive *psychical* processes and properties of consciousness—not to mention the unconscious—are dismissed from the materialist framework. While a physical system can be dynamically organized and functionally sophisticated, in the end, the organism—not the self—is doing the thinking and behaving. Materialists would contend, however, that the organism *is* the self. But it is precisely this definitional issue that becomes problematic. The notion of the self plays a great role in human value practices and should not be conceived merely as a physical entity. We cannot simply reduce human experience, personal identity, character formation, and selfhood to atoms and sub-atomic particles without losing the integrity of freedom and an ontologically transcendental self.

Furthermore, materialism offers very little comfort for those looking for the possibility of a personal afterlife. Not only are free will and the self eliminated, but materialism is consequentially a fundamental atheism. Spiritual transcendence of the soul or personality, and the possibility of an afterlife are not tenable within the materialist framework. If the mind or psyche is nothing more than its material substrate (merely active particles), then the substance ceases to exist upon its physical death. The soul as psychical substance could not exist in disembodied form, hence death of the organism is death of the soul. As Graham (1993) told us, if "the soul is something mental and the soul survives bodily death, whereas the brain fails to survive, then there is no such thing as a soul" (p. 129). Unless there were some miraculous means by which to reconstitute brain-matter, the soul would not exist. It would be virtually impossible to rebuild and reconnect the millions of neural pathways destroyed by physical decay, such as in the case of brain trauma or dementia. And if this were possible, such as in some *Star Trek* episode, the question of sustained personal identity would remain equivocal. By definition, reconstituted matter would no longer be identical to itself. A duplicated self would not be the same self. For materialists, all natural phenomena eventually pass out of existence and return to an eternal, primordial, material ground in an eternal transformation of matter, so wave "good bye" to a personal afterlife. Simply put,

spiritualism, supernaturalism, immaterialism, disembodiment, transcendentalism, and any appeal to mystical experience, revelation, or faith are untenable hypotheses. . . .

Value Judgments Concerning Social Practices

Because materialism is overidentified with a scientific epistemology, there is a tacit prejudice that the human being is a biological machine that one can control, predict, and manipulate. Science and medicine have provided and continue to provide humanity with knowledge and technology that drastically improve the quality of life, but there is an inherent danger in the tendency to view the human being as nothing more than a biological organism. Within this context, there is a medicalization or objectification of the human subject. The hazard in this treatment of the subject as an object is that it may lead to social, political, and scientific practices that fail to account for the dynamic psychological complexity of mental life and the existential human needs inherent in conscious experience. This biased naturalistic view may condone various professional practices in medicine, psychiatry, and the social sciences. We have already seen how the medical model of psychiatry has usurped psychological approaches to the treatment of certain types of mental illnesses. For example, Prozac is preferred over psychotherapy as the salient mode of intervention for depression—assuming that all forms of depression have a biological correlate that is confused with etiology, hence all forms are physically caused. This is simply erroneous. The danger of such medical practices is that people get the message that all they need to do is take a pill and they will be happy. Physical interventions and psychopharmacological treatments may be appropriate for some medical or psychiatric conditions, but certainly not all. Such objectification of the human being may potentially justify myriad ethically dubious practices (e.g., fetal tissue research, euthanasia, physician-assisted suicide, genetic and human cloning). The reduction of the phenomenology of consciousness could further lead to an invalidation of uniquely subjective, lived, existential experience. The human being is not just an organism to be manipulated by science; rather a person is to be acknowledged and valued. The medicalization of and clinical depiction of the human being seem to lack a degree of empathy, concerned solicitude, and careful insight into the array of human experiences that cannot be reduced or explained away with technical jargon or physicalistic nomenclature. . . .

Another potentially dehumanizing aspect of the materialist agenda is that it advocates a change in linguistic communication practices that emphasize physical description. For example, Paul Churchland (1981) proposed that we adopt a new language to describe brain states rather than conscious experiences. This was proposed earlier by Smart (1962), who stated "it would make sense to talk of an experience in terms appropriate to physical processes" (p. 173). Why? Why do we need a conceptual and social

change in language and communication practices? How would it be pragmatic and useful for people to communicate their complex cognitive, emotive, and psychological experiences in physically descriptive language? How could doing so facilitate arriving at a more accurate picture of inner reality? Instead of saying, "I love you," we would say, "My neurons are firing in sector 14.2 of my left frontal lobe." Is love really like a heatwave (see Levin, 1986)? Churchland (1981) even went so far as to propose that we eliminate current social language practices and replace them with an alternative language that would require monumental social and educational changes, not to mention experimental surgery on human beings. He suggested we could "construct a new system of verbal communication entirely distinct from natural language" (p. 220). Such a proposal would require massive changes in the way the world thinks, communicates, and operates. In addition, he proposed placing a "transducer for implantation at some site in the brain" (p. 221).

To me this is clearly an unethical proposal and probably motivated by the need to generate controversy in the service of personal narcissism, ideology, or both. Experimentation on humans?—as if everyone would be a willing participant. The ramifications of such a practice would completely alter the way people think, talk, and perceive reality; thus personality, identity, and one's sense of self would be radically mutated. In essence, people would no longer be who they previously were: It would be tantamount to turning people into machines. . . .

Toward Psychic Holism

Throughout this article, I have attempted to delineate five dangers of materialism characteristic of the naturalistic and physically reductive paradigms within the cognitive sciences and the philosophy of mind today. Perhaps the main motive of materialism is simply this: If you say all mental events are just physical events, then you do not have a mystery—the mind-body conundrum is solved. Scarle (1994) summarized this position: "The famous mind-body problem . . . has a simple solution. . . . Here it is: mental phenomena are caused by neurophysiological processes in the brain and are themselves features of the brain" (p. 277). This is reductionism at its finest.

The claim that the mind is nothing but the brain is a dogmatic assertion that attributes ontological primacy to physical states over mental processes and properties. In short, the materialist holds a fallacious and simplistic view of causality, denies free agency of the self, and increasingly portrays the human being as a clinical object. The ethical implications of such approaches in medical and social-political practices may potentially threaten the integrity of individuality and collective identity, which may further lead to an invalidation and/or empathic impasse regarding human difference and understanding.

Furthermore, within this context, the transcendental features of psychic reality—emotive, aesthetic, spiritual, moral, and religious experience—are

trivialized. Not only is the quality of the lived experience truncated, but materialism consequently neglects the function and role the concept of self assumes for human value. The value and concept of our sense of self serve a fundamental structural and functional role in identity, ethical responsibility, and self-representation. The transcendental qualities of experience and selfhood are in danger of becoming displaced if we are to view the human condition solely from naturalistic paradigms. While the boon of materialism is scientific, medical, technological, and consequently social advancement, the bane is the demise of the self as a complex integrated whole. . . .

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POSTSCRIPT

Are Mind and Brain the Same?

The fields of psychology and cognitive science continue to debate the mind/body or mind/body issue. Churchland believes that mental processes do not exist as anything separate or different from the brain. What we once called mental processes are only brain activities. He draws upon the work of neuroscientists and computer scientists working in artificial intelligence to support his view that even though we intuitively believe we have an existence separate from our bodies, we are fooled by sophisticated brain processes. Churchland favors a scientific approach that focuses on verifiable evidence, namely brain research and computer modeling of brain activities.

Mills points out the dangers of the eliminative materialism of Churchland. The five dangers he describes are: (1) the rejection of the unique and separate existence of consciousness, (2) the simplistic view that psychological attributes are directly linked to physical structures, and thus all mental activities are caused by physical structures, (3) the elimination of any possibility of free will, (4) the loss of any sense of self, and (5) the degradation of human beings as biological machines and the resulting change in social values. Mills believes we should strive for a psychic holism that acknowledges our emotional, aesthetic, spiritual, religious, and moral experiences.

In many instances, the mind/body issue is presented in a way that makes the reader feel as if one has to be totally on one side or the other. Mills accuses those who hold the materialism view of being dogmatic in their assumption that there is only brain activity and nothing more. While the debate may be presented this way, it is not the only approach. A well-known leader in the fields of multiple intelligences and education, Howard Gardner recently wrote an essay for *The Chronicle of Higher Education* on this topic. Gardner prefers to think of a continuum of ways of understanding, spanning from physics and biology to ethics and religion. He states, "In essence, there is no gulf between behavior and soul; nor is there a need to insist that science and philosophy have nothing to say to each other. At each point on the continuum, a somewhat different blend of disciplines and intellectual tools must be drawn upon" (Gardner, 2001).

The mind/body debate raises many important foundational issues that move us to the core of psychology and cognitive science, both historically and currently. Historically, psychology has been viewed as both a natural science and a social science. Currently, the field of psychology includes many different and unique areas, such as behavioral neuroscience and cognitive therapy. Some have predicted that such a variation in viewpoints will

cause psychology to fracture, with some moving to the natural sciences, others to cognitive science, and still others moving to the philosophy. What do you think about that possibility?

The mind/body debate leads us to think about the relationship between the areas that make up cognitive science. Should we strive to map the human psyche in much the same way as a chemical periodic table? Should we strive to build machines that would fully imitate the human brain? Should we strive to understand human nature and our core self? Should we try to do all these? How might we best move forward in all these areas? The mind/body debate will likely continue for a long time to come, and our response to it will shape the cognitive science of the future.

Suggested Readings

1. Brothers, *Mistaken Identity: The Mind-Brain Problem Reconsidered* (Albany, NY: SUNY Series in Science, Technology, and Society, 2002).
- A. Clark, *Being There: Putting Brain, Body, and World Together Again* (Cambridge, MA: MIT Press, 1998).
- H. Gardner, "The Philosophy-Science Continuum," *The Chronicle of Higher Education* (Volume 47, Issue 26, March 9, 2001).
- J. Horgan, *The Undiscovered Mind: How the Human Brain Defies Replication, Medication, and Explanation* (Westport, CT: Touchstone Books, 2000).
- J. W. Richards (Editor), *Are We Spiritual Machines: Ray Kurzweil vs. the Critics of Strong Artificial Intelligence* (Seattle: Discovery Institute, 2002).

