Monist Models of Mind and Biological Psychiatry

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Theories of psychiatry do not exist an intellectual vacuum. They must mesh at many points with other bodies of knowledge. Biological psychiatry tries to prove that mental disorder and brain disorder are one and the same thing. This has no rational basis in any accepted theory of mind. This article examines two other philosophical theories that biological psychiatrists might use as their rationale: Dennett's functionalism and Searle's natural biologism. However, these avowedly antidualist theories fail, as they secretly rely on irreducibly dualist notions to complete their explanatory accounts of mind. Biological psychiatry is thus an ideology, not a scientific theory.

Keywords: theories of psychiatry; biological psychiatry; functionalism; natural biologism; dualism

Recent unsavory events in which psychiatrists are alleged to have taken large sums of money in exchange for research that produced results favorable to certain viewpoints (Citizens Commission on Human Rights International, 2009) should come as no surprise. Years ago, it was suggested that the reason psychiatry has periodic scandals is just because it has no formal model of mental disorder to define the field within which interventions may legitimately occur (McLaren, 1996). Without a declared model, there is no coherence, so that the practice of psychiatry is driven by the strongest social forces, as distinct from scientific forces. In the main, this means financial forces. Since the starting point in any scientific endeavor is a declared theory or model to limit the area of study, this renders the whole field of psychiatry prescientific. A detailed critique of the logical status of the various theories used in psychiatry (McLaren, 2007, 2009) shows that each of them fails the minimal criteria of what constitutes a scientific theory. Moreover, not one of them can be developed to the point where it could satisfy those criteria. These days, very few psychiatrists would be surprised to hear that about psychoanalysis and behaviorism, but it also applies to biological psychiatry. Despite the enormous sums of money spent on biological research in psychiatry each year, there is no accepted model of mental disorder that such research addresses. All the activity proceeds in an intellectual vacuum in which practitioners unthinkingly assume that what they are doing represents science. In fact, it is mere scientism, the inappropriate application of scientific methods and procedures to questions with no empirical content.

Because psychiatry has failed so signally to set its intellectual house in order, it is appropriate to look to other disciplines to see what they have to offer. These days, there are really only two possibilities for the title of "the correct theory of mind." The first is a reappraisal of the ancient doctrine of dualism (Chalmers, 1996), now termed "natural dualism" to distinguish it from the many forms of supernatural dualism that went before.

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Chalmers's case is that "consciousness must be taken seriously," specifically as an ontologically separate and causally effective factor in human behavior. Opposing this view are various forms of monism, the notion that mind and brain are not separate but are, in some crucial sense, one and the same thing. For example, the philosopher Daniel Dennett (1993) has argued powerfully against the "hopelessly contradiction-riddled myth of the distinct, separate soul" (p. 430). He espouses the monist stance known as functionalism, which takes mental states as dispositional states intervening between input and output. These states are biological in nature so that a full understanding of brain physiology will give a complete understanding of the mind.

Another philosopher, John Searle, advocates "biological naturalism." This claims that consciousness is wholly a biological phenomenon which can "no more lie around separate from my brain than the liquidity of water can be separated from the water, or the solidity of the table from the table" (Searle, 1999b, p. 41). At first, it would appear that there is very little separating these views but there are important differences. For example, Searle dismisses Dennett's approach on the basis that it cannot give a full account of the experience of being a sentient being. Nonetheless, I will argue that both of them fail in their primary ambition of demonstrating how a nondualist model of mind can be derived from first principles.

This is of major significance for biological psychiatry, as it is predicated on the basis of there being (somewhere) a monist theory of mind.

DENNETT'S FUNCTIONALISM

Daniel Dennett, who has worked for many years at Tufts University in Boston, is a prolific writer with a breezy style, which has helped make him something of a favorite among the more scholarly psychiatrists. In addition, he uses many biological examples to justify his views, which often emerge only ostensively. This article looks at his claim, in his 1993 book *Consciousness Explained* (Dennett, 1993), to have outlined the grounds for a nondualist, biological theory of mind. He has elaborated his ideas in a number of publications since then (1996, 2004), so we can assume that these works represent the essentials of his position.

In *Consciousness Explained,* Dennett mounts a vehement case against any and all forms of dualism on the basis that they are irredeemably irrational. His interest goes back to his first year in college, when he read Descartes' *Meditations* and was "hooked on the mind-body problem" (1993, preface). Descartes' formulation was that the mind is a real thing, capable of interacting with the brain to control the body. Unlike the body, it has no shape, no form or color, no size, nor even a location inside the fragile box of bones called the skull. Nobody has ever seen a mind, spirit, or soul, yet, from direct experience, everybody knows that there must be something that does the thinking, experiencing, and acting. To Descartes, it had to be a special kind of real thing, made not of bone and meat stuff but of spirit stuff, a stuff that we humans have but that the lower animals don't. However, this immediately bothered the young Dennett: "How on earth," he asked, "could my thoughts and feelings fit in the same world with the nerve cells and molecules that made up my brain?"

He has been working on the question ever since, making "some progress" to the point where he offered the boldly titled *Consciousness Explained.* He grants little time to other

philosophers' attempts to examine this most difficult of areas, dismissing them as yielding only "self-contradiction, quandaries or blank walls of mystery" (Dennett, 1996). His view is that "the various phenomena [of] consciousness . . . are all physical effects of the brain's activities" (1993, p. 16). He concedes that it is "very hard to imagine how your mind could be your brain—but not impossible." He was, however, convinced that "a theory of the biological mechanisms" would resolve the "traditional paradoxes and mysteries of consciousness." His approach would succeed where others had failed because they "got off on the wrong foot."

The first—and worst—wrong foot is the "forlorn" notion of dual entities, the mind as one substance and the brain as another. Based in his early apprehension of the problem of Descartes' solution, Dennett sees dualism as crude magical thinking that violates the fundamental laws of the universe, creating endless logical problems while solving none. At different points, he rails against it ("accepting dualism is giving up"), belittles it ("I wiggle my finger by . . . what, wiggling my soul?"), or mocks it ("ectoplasm, Wonder Tissue") because it is false, incoherent, and antiscientific: "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 . . . if dualism is the best we can do, then we can't understand human consciousness" (Dennett, 1993, pp. 37–39). His preference is an unalloyed materialism: "Somehow, the brain must be the mind" (p. 41).

He develops his case further in a later publication:

> What makes a mind powerful—indeed, what makes a mind conscious—is not what it is made of, or how big it is, but what it can do. Can it be distracted? Can it recall earlier events? Can it keep track of several different things at once. . . . When such questions as these are answered, we will know everything we need to know about those minds. . . . These questions will capture everything we want to know about the concept of consciousness. (Dennett, 1996, p. 210)

"But," a persistent questioner may demand of him, "what about conscious experience? Where is there room for the sheer *experience* of pain, in your model?" This brings Dennett to his most contemptuous: if he stamps on your foot, he snorts, you will feel only a fleeting pain that is so minor as not to warrant the label of "suffering." It would be a "risible" misuse of the term to apply it to an irritation that is no more than "a brief, negatively-signed experience . . . of vanishing moral significance" (p. 220). If we look at the mind from the right point of view (naturalism) and ask the right questions, we will eventually get out of the old, magical way of thinking and see the mind for what it is, a virtual machine generated by the high-speed, multimodal, distributed information processing system that is our brain. Pain is merely the functional state which inclines you to wince and complain, nothing more, hence the name of his model, functionalism.

In *Freedom Evolves,* Dennett (2004) sets himself the task of answering one of the main objections to a naturalistic theory of mind, the question of free will and morality. If molecules don't have free will and if the human brain is made of molecules, how can we humans have freedom of choice? Similarly, if we write God out of the equation, what is the source of morality? Materialism is such a mechanistic and amoral system that many right-thinking people are simply repelled by it, but Dennett disagrees totally. Even if the natural world is truly deterministic, it is possible to show that humans have genuine free will from which derives a nondivine morality. He scathingly dismisses dualist attempts to explain these phenomena: "like the little green man in the control room of the man-sized

puppet in the morgue in *Men in Black*… an immaterial portion of glowing ectoplasm that oozes around in your brain like a ghost amoeba… an angel whose wings are folded till you are called fly to heaven" (p. 232). A proper theory must avoid all hints of dualism, as it is necessarily puerile nonscience.

His case for free will is based on the fact that humans are consummate information processors, capable of driving physical processes against their natural directions as determined by the normal laws of the universe: "Human freedom is not an illusion; it is an objective phenomenon, distinct from all other biological conditions and found in only one species." Moving in ordered steps along "non-miraculous paths," we proceed from "senseless atoms to freely chosen actions" (Dennett, 2004, p. 305) with no loss of human dignity or autonomy. We are neither marionettes on behaviorist strings nor temporary homes for wispy magical spirits. We do not have to resort to such desperate ploys as invoking quantum indeterminacy to account for human thought and decision making. Instead, Darwinian theory shows how the mind arises by the same processes which force evolution in, say, snails: "when language came into existence, it brought into existence the kind of mind that can transform itself on a moment's notice into a somewhat different virtual machine, taking on new projects, following new rules, adopting new policies. We are transformers. That's what a mind is, as contrasted with a mere brain, the control system of a chameleonic transformer, a virtual machine for making more virtual machines" (pp. 250–51).

Dennett puts great emphasis on the role of language in converting us from semiautomated mimics (like parrots) to truly autonomous agents: "language, when it is installed in a human brain, brings with it the construction of a new cognitive architecture that *creates* a new kind of consciousness—and morality" (Dennett, 2004, p. 260). Sometimes, he uses the term "self" (e.g., p. 273) to describe this feature, but the details of the actual mechanism are the same: "What, then, is the important role of such a self? The self is a system that is *given* responsibility, over time, so that it can reliably be there to *take* responsibility, so that there is somebody home to answer when questions of accountability arise" (p. 287; emphasis in original).

He emphasizes that birds can voluntarily wheel this way and that without the benefit of language, but "We have added a layer on top of the bird's (and the ape's and the dolphin's) capacity to decide what to do next. It is not an anatomical layer in the brain but a functional layer, a virtual layer composed somehow in the micro-details of the brain's anatomy." This creates the "special category of voluntary actions that sets us apart." Our actions are "morally self-forming," and, while this is unique in the world, it is most emphatically not magic or supernatural in any way: "Mental contents become conscious not by entering some special chamber in the brain, not by being transduced into some privileged and mysterious medium, but by winning the competitions against other mental contents for domination in the control of behavior, and hence for… entering into memory" (Dennett, 2004, p. 253).

Satisfied he has dispensed with the threat of the ghostly gremlin in the head, Dennett now needs to show what he proposes in its place. This takes some time to emerge. In *Consciousness Explained*, he outlines his position:

> Human consciousness is *itself* a huge complex… that can best be understood as the operation of a "*von Neumannesque*" virtual machine *implemented* in the *parallel architecture* of a brain that was not designed for any such activities. The power of this *virtual machine* vastly enhances the underlying powers of the organic *hardware* on which it runs. (Dennett, 1993, p. 210)

He uses the examples of snails secreting calcium to spin a shell or beavers using mud to build a dam to illustrate his point that the genetic endowment of the human species allows us to weave a "self" that protects us "just like the snail's shell" (p. 416). This "web of discourses . . . is as much a biological product as any of the other constructions to be found in the animal world." Just like the snail, the spider weaving its web, or the beaver building its dam, we do not "consciously and deliberately figure out what narratives to tell" while building our protective selves: "Our tales are spun but, for the most part, we don't spin them; they spin us." Since his virtual machine, which he later calls the "psychological self" to distinguish it from the biological self (of immunity), is a biological exudation of the genetically determined human brain, it does not fall into the classic error of dualism: "Since selves and minds and even consciousness itself are biological products" (p. 421), the question of a supernatural "mind stuff" does not arise.

"A self," he continues, "is not any old mathematical point, but an abstraction defined by the myriads of attributions and interpretations . . . that have composed the biography of the living body whose Center of Narrative Gravity it is" (Dennett, 1993, p. 426). Gradually, he fills in the details of his biological model of consciousness so that it builds up "a defining story about ourselves," incorporating sensation, memory, fantasy, "tendencies, decisions, strengths and weaknesses," up to and including free will and moral responsibility. In short, except for immortality, his biological concept of self does everything that the much-despised Soul did. However, since his self is a biological product, firmly fixed within the biological realm, it does not breach any of the fundamental laws of the universe. He is aware that, as an informational state, the conscious mind could be duplicated in a suitable artificial medium, so that machine consciousness is not just logically possible but feasible as well. If people can't grasp that implication, then that is their failure of imagination rather than a limit imposed by the nature of the real world.

SEARLE'S BIOLOGICAL NATURALISM

John Searle, who has been at Berkeley for about 50 years, is not convinced by Dennett's claims. Searle's spare and sober style is more conventional, and he tends to state his position early and then justify it point by point. A transparent definition of consciousness dates from 1993: "By 'consciousness' I simply mean those subjective states of sentience or awareness that begin when one awakes in the morning from a dreamless sleep and continue throughout the day until one goes to sleep at night or falls into a coma, or dies, or otherwise becomes, as one would say, 'unconscious'" (Searle, 1993). This is exactly what other people would call "mind," and Searle appears to use the terms interchangeably as well. In a short, synthetic work, *Mind, Language and Society* (1999b), Searle argues that consciousness is wholly a biological phenomenon that can "no more lie around separate from my brain than the liquidity of water can be separated from the water, or the solidity of the table from the table" (p. 41).

Searle's objection to functionalism is that it discounts the subjective nature of a mental state as something experienced by an agent, even when the agent does nothing. A good example of how this "short changes" human experience is Dennett's example of standing on somebody's foot (see above). Consistent with Searle's critique of functionalism, it would be entirely fair to ask Dennett if he would still believe that if somebody stamped

on his little granddaughter's foot. Similarly, if a man were profoundly depressed to the point where he did nothing but sit and stare into space all day, there would be nothing in his "input states" that could account for his diminished output. Only his intrapsychic experience could explain it. Classing the experience of depression as a "brief, negatively-signed experience of vanishing moral significance" would increase the sufferer's distress but not explain it. A nonsubjective account of consciousness is not an account of consciousness at all but rather an account of something else (and not very interesting at that). Human mental life is a reality. Thus, Searle concludes, functionalism cannot be taken seriously.

However, this approach raises a fundamental question about how the mental stuff interacts with the physical. If they are truly different in nature, there could be no point of contact between them. Mind–body interaction would be impossible, and the attempt to explain mind and body would break down. He takes an uncompromising position on anything that smacks of dualism: "I think (dualism) is false" (Searle, 1999b, p. 11).

> Dualism comes in two flavors, substance dualism and property dualism. According to substance dualism, there are two radically different kinds of entities in the universe, material objects and immaterial minds. . . . Property dualism is the view that there are two kinds of properties of objects that are metaphysically distinct. . . . All forms of dualism share the view that the two types are mutually exclusive. (p. 45)

However, he is not convinced by the apparent ease with which property dualism sidesteps the metaphysical problem of dual substances: "I do not believe that we live in two worlds, the mental and the physical—much less in three worlds, the mental, the physical and the cultural" (p. 6; presumably a reference to Popper's World III; see Popper & Eccles, 1981). He continues, "Dualism in any form makes the status and existence of consciousness utterly mysterious. . . . Having postulated a separate mental realm, the dualist cannot explain how it relates to the material world" (p. 47). A few pages later, he dismissed all dualism as beyond the pale: "The way to defeat dualism is simply to refuse to accept the system of categories that makes consciousness out as something non-biological, not a part of the natural world" (p. 52). He has reiterated this view a number of times; for example, "As long as we continue to talk and think as if the mental and the physical were separate metaphysical realms, the relation of the brain to consciousness will forever seem mysterious, and we will not have a satisfactory explanation of the relation of neuron firings to consciousness" (1993, p. 8; 2007).

His own view is that, beginning to end, the mind is biological in nature: "Above all, consciousness is a biological phenomenon. We should think of consciousness as part of our ordinary biological history, along with digestion, growth, mitosis and meiosis" (Searle, 1993, p. 1). Elsewhere, he adds photosynthesis and the secretion of bile to this list, leaving no doubt where he stands: "We must stop worrying about how the brain *could* cause consciousness and begin with the plain fact that it *does*" (1999a, p. 8). "We live in one world, and all the features of the world from quarks and electrons to nation states and balance of payments problems are, in their different ways, part of that one world." "All of our mental phenomena are caused by lower level neuronal processes in the brain and are themselves realized in the brain as higher level, or system, features" (2002, p. 1). "The smell of the flower, the sound of the symphony, the thoughts of theorems in Euclidian geometry—all are caused by lower level biological processes in the brain; and as far as we know, the

crucial functional elements are neurons and synapses" (2000). The mind is not, however, an ordinary biological phenomenon like, say, snails secreting shells, beavers building dams or humans excreting, it is removed from these matters: "consciousness is caused by brain processes and is a higher-level feature of the brain system" (1999b, p. 54).

As a subjective phenomenon, mind is not reducible to "mere chemistry," such as is possible with digestion or the solidity of wooden tables. In outlining his opposition to property dualism (2002), he stated,

> The property dualist and I are in agreement that consciousness is ontologically irreducible.... I insist that from everything we know about the brain, consciousness is causally reducible to brain processes....I deny that the ontological irreducibility of consciousness implies that consciousness is something "over and above," something distinct from, its neurobiological base (p. 4).

That is, he excludes the possibility that there can be a natural explanation for two ontologically different matters or forms in the universe. Everything that exists must reduce causally to matter and energy:

> "Consciousness" does not name a distinct, separate phenomenon, something over and above its neurobiological base, rather it names a state that the neurobiological system can be in. Just as the shape of the piston and the solidity of the cylinder block are not something over and above the molecular phenomena, but are rather states of the system of molecules, so the consciousness of the brain is not something over and above the neuronal phenomena, but rather a state that the neuronal system is in (p. 4).

He sees no room for negotiation on his view that consciousness is a "biological phenomenon like any other" that derives from the particular functional organization of the brain ("This proposition is not up for grabs"; 1999b, p. 51). Because it is a natural feature of brains, the mind cannot lead a separate life, meaning that immortality, telekinesis, and the rest of the ancient dualist tricks are excluded. His task, therefore, is to steer a path between these constraints to find a theory of consciousness that does not fall apart at the first hurdle.

There are, Searle (1999b, pp. 73–80) argues, 10 features to the structure of consciousness that constrain any theory:

1. Consciousness is subjective, and there is no way this can be gainsaid or "explained away" without thereby losing the quintessential feature of mind. All conscious states exist only as they are experienced by an agent with a mental capacity: "However, though consciousness is a biological phenomenon, it has some important features that other biological phenomena do not have. The most important of these is... its 'subjectivity'" (Searle, 2000, p. 557).
2. Consciousness is a unity, coming to us as a single, unified experience: "Thus, it is unthinkable that my conscious states should come to me as a simultaneous series of discrete bits" (1999b, p. 83).
3. Consciousness gives us access to the real world, and two essential tools for dealing with that world are our cognitive capacities (knowing what and how) and volition, the determination to deal with the world. Some mental states are "unconscious" (what happens to a belief when we are asleep?), but they are not thereby any less real. Mental states exhibit directedness, or intentionality, which is also irreducible, but nonintentional mental states are possible, such as free-floating anxiety.
4. "All of our conscious states come to us in one mood or another," meaning there is always a mood of some sort attached to each mental event.

5. Consciousness imposes a structure on the often disjointed but otherwise overwhelming sensory input, filtering it and filling in the gaps as it were.
6. Every conscious being has the capacity for attention: "Attention is like a light that I can shift from one part of my conscious field to another" (1999b, p. 78).
7. Every conscious state is nested in a "Background" of essential information, which helps us orient ourselves in changing circumstances. Even if I am not fully aware of it, the object of my current conscious state brings with it a vast array of knowledge that assists in integrating the current experience into a continuing reality: "I just take a huge metaphysics for granted." Part of this Background is common to all humans and part is local culture: "our capacity for rational thought and behavior is for the most part a Background capacity" (1999b, pp. 108–109).
8. Each state also brings with it a sense of familiarity of variable intensity.
9. Every thought leads to another, as part of the Background knowledge state.
10. To a greater or lesser extent, conscious states are pleasurable or unpleasurable, occasionally both together.

DENNETT'S ERSATZ MONISM

When is dualism not dualism? When it is a biological dualism. In an echo of Orwell's "four legs good, two legs bad," Dennett avers that "biological dualism is good, psychological dualism is bad." He illustrates a classic and invariably fatal error in philosophy: he has not defined his terms. Granted, he gave a definition for dualism (see above), but he omitted to examine the word to see if it might have other meanings or usages. And it does. Dualism does not mean just "of two substances." It means "the state of being two-fold or double, of two opposed *natures*" (emphasis added). So when Dennett proposes a "virtual machine" that runs on and controls the brain's "hardware," or a Self composed of a web of words and deeds, a "psychological or narrative self…an abstraction, not a thing in the brain," what exactly is he doing? He is proposing that the human animal has a dual, or two-fold, nature, consisting of a real, physical body and something else nonphysical. And by postulating that nonphysical "something else," he assembles a dualist model because that's what dualism is: two opposed natures: "The crux of dualism is an apparently unbridgeable gap between two incommensurable orders of being that must be reconciled if our assumption that there is a comprehensible universe is to be justified" (Watson, as cited in Audi, 1995, p. 210). Dennett's "virtual machine," or Self, comfortably meets that definition.

The fact that he defines his Self as biological and thereby not a hopelessly wrong, myth-riddled bit of ectoplasm peeking out of the trash can of history is beside the point. Dual means two, and a virtual machine (of whatever nature) is necessarily of a nature distinct from the physical machine it inhabits: by their very definition, physical and virtual are "incommensurable orders of being." So Dennett's vast intellectual effort merely brought him back to his starting point of how the two interact: *Plus ça change, plus c'est la même chose*. Descartes, of course, had the easy task: his supernatural soul interacted with the body miraculously. But with his *dualisme à la mode*, Dennett sets himself the much more difficult job of showing how a virtual machine called the Self could arise from and interact with its associated physical body without breaking any rules of nature. By insisting that his Self is secreted like a snail's shell, he has to show that the words that compose it are biological *in nature*, that our beliefs occupy the same ontological realm as the mud in a beaver's dam, and that the "web of discourse" a human weaves is

conceptually the same as a spider's web. I don't believe he can show any of these things. Fortunately, nor does he.

He explicitly states that our "narrative selves" could theoretically be stored in a computer as "sheer information" (Dennett, 1993, p. 430) and even duplicated a thousand times. By arguing that we can reduplicate the conscious human self in a computer, he has immediately committed himself to the notion that information is not the same as the substrate that encodes it; that is, without giving up his antagonism, he accepts (a form of) dualism. He agrees that a verbal description of mud is not the same thing as the mud itself because symbols are never the same as the thing they represent. If I talk about mud, mud does not come out of my mouth, nor do you catch an earful of mud. Every symbol is a duality, an order of being which is utterly distinct from the thing it represents. If it were not incommensurable, it wouldn't be a symbol of it. That's what "symbol" means.

However, he could have saved himself this embarrassment by being less doctrinaire. Chalmers's natural dualism, mentioned above, formalizes Dennett's implicit notion of consciousness supervening on a particular physical structure in a lawlike way while preserving the irreducible duality of, among others, language and its objects.

So, despite his prolix protests, Dennett turns out to be a closet dualist.

The significance for psychiatry is that, as it is presently formulated, biological psychiatry is a form of monism. That is, the concept of a "biochemical imbalance of the brain" as the cause for all mental disorders depends on an indefensible philosophical claim. His claim that mental states are of "vanishing moral significance" bolsters biological psychiatry's preoccupation with mental states merely as indicators of a supposed underlying biochemical lesion. The failure of Dennett's "functionalism" means that biological psychiatry can never be nested in a larger, formal theory of mind that justifies its essential claim.

SEARLE'S UNNATURAL BIOLOGISM

Searle's monism fails for similar reasons. Without realizing it, he, too, has used dualist concepts to complete the causal chain in his nondualist explanation. In the first place, Searle's unyielding, visceral antipathy to dualism blinds him to the very obvious fact that an ontologically separate and irreducible state can coexist in natural harmony with an entirely separate state, if and only if it is an informational state generated by a physical machine. An informational state floats, as it were, in the machine that generates it, everywhere but nowhere, utterly dependent on the machine continuing to function as designed. An informational state is "causally reducible" to its physical substrate but "ontologically irreducible" to that substrate. This satisfies Searle's major objection to property dualism, that ontological separation necessarily means consciousness will forever be mysterious: not if it is an informational state generated by the physical substrate of the brain. The material realm is subject to the laws of thermodynamics, the informational realm to the laws of its particular syntax, so the two are forever alien realms, intimately related in a causal sense, but nothing can cross from one realm to the other unless certain boundary conditions obtain (McLaren, 2009). If those conditions are realized, then the two realms or worlds become mutually interdependent. So if we say that mind is an informational state generated by the brain, we scoop up Searle's requirements of privacy, insubstantiality, and subjectivity in an entity (*sic*) that is causally reducible but ontologically irreducible.

Second, the claim that the mind is essentially biological rests on a misunderstanding of the term "biological." It is one thing to say that the mind springs from the biology of the brain, something else again to assume that it is a single, one-step process that remains within the purview of the laws of thermodynamics. There is no a priori reason to suppose that the mind arises from the brain as, say, the hypothalamic releasing factors arise from the brain. The brain is an organic structure, but, by virtue of its function, it supports an informational processing space. Inadvertently, Searle concedes this case many times: "We live in one world, and all the features of the world from quarks and electrons to nation states and balance of payments problems are, in their different ways, part of that one world" (1999a). "All of our mental phenomena are caused by lower level neuronal processes in the brain and are themselves realized in the brain as higher level, or system, features" (2002, p. 1). The expressions "in their different ways" and "higher level or system features" denote something not the same, of another nature, and this in turn means "of a dual nature." Just as Dennett did, Searle has smuggled dualism into his monist system, and, from there, it does all the work. *Sans dualisme*, his monism flops helplessly on the floor, a body without a mind.

This brings us to a further, major error. Searle claims that brain processes and their various products are all of a biological nature: "mental phenomena are ordinary biological phenomena in the same sense as photosynthesis or digestion" (1999a, p. 6). This is a non sequitur. He has made the mistake of conflating the biological mechanisms or machinery by which the brain produces the mind, with the nonbiological output of those same mechanisms. The structure of a machine and its function, performance, role or output, and so on are two entirely different things. Just because the brain is a biological organ, constrained and driven by the laws of the material world (thermodynamics), does not mean that its output is going to be of the same nature. There is nothing in the nature of (physical) machines or the laws of thermodynamics themselves to prevent a machine developing, for example, an informational space as its output.

An informational space can be lifted to unimaginable levels of complexity without further modification of the physical machine that generated it (Turing, 1936). The human brain may be smaller than a dolphin's, but since we have something called language (and opposable thumbs, of course), we dominate the dolphins, not vice versa. If Searle agrees that the mind can be duplicated in a computer, then he is agreeing that the mind is an informational state because there is only one thing computers can do, manipulate information. By syntactical transformations, using what information technology calls virtual machines generated by algorithms, the semantic content of the mind is transformed beyond recognition, magnified and amplified until a finite input becomes a near-infinite output. A virtual machine is ontologically different from a physical machine, but an infinite virtual machine can be generated by a finite informational calculator. Thus, Searle uses the unthinkable, dualism, to complete the causal chain of his model.

If we recast the mind as an informational space, it immediately falls into the purview of science. Of course, not all information is itself scientific (e.g., poetry), but the concept of information free of content is a valid, rational model and therefore can be investigated by science. By redefining mind as an informational space generated by the brain, we achieve one of Searle's major goals. Information coded in the brain can move freely from mind to brain and back again, so his ontological objections to dualism collapse.

CONCLUSION

Each of the articles published in a recent edition of this journal (vol. 11, no. 3, 2009) pointed to some of the many failings of the orthodox modern approach to mental disorder. The reason it has so many failings is because there are no formal models of mental disorder. In turn, there are no models of mental disorder just because there are no adequate models of mental order, or mind, as we say. As part of the technology of medicine, psychiatry ought to be based on an accepted scientific model of mental disorder. At first glance, biological psychiatry seems to fit the requirement. Across medicine generally, the notion of biological reductionism applies, that is, that a full understanding of the body's structure and function will give a full understanding of its pathology. In its claim to be part of ordinary medical or biological science, biological psychiatry is absolutely dependent on the notion that a full understanding of brain function, including its pathology, will give us a full understanding of mental disorder. I have previously argued that this claim is false (McLaren, 2007, 2009), as it depends on philosophical claims—mind–body identity theory and biological reductionism—which cannot be justified.

This still left two logical possibilities on which to build a biological psychiatry, Dennett's functionalism and Searle's biological naturalism. These two theories of mind are monist; that is, they oppose the idea of dualism, the concept that the mind is a thing in its own right that can neither be dismissed as irrelevant nor reduced to the brain that generates it. In very brief outline in this article, I have shown that each of these theories is not, in fact, a monist theory at all, as each uses covert dualism to complete its explanatory chain of causation.

This is of profound significance for biological psychiatry because, at present, there are no other possibilities it can use to justify its claim that "mental disorder is a chemical imbalance of the brain" or any of the other slogans in use. This means that biological psychiatry is not a valid scientific stance but is simply a position that people assume because it suits them, without their being able to justify it logically. That is, biological psychiatry is an ideological stance, not a science. That is why it fails to give a full, humane understanding of mental disorder.

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