Dualism and Neuroscience:
Notes toward a Rapprochement on Terms Favorable to Consciousness

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In this paper, I offer a new account of mind/body interaction that shows how it is possible for an immaterial mind or soul to influence a physical system without entering the horizontal system of efficient causes studied by natural science.

In a previous paper in this series, I argued that, rather than being extended, or even complemented by such research programs as "cognitive science" and "neurophilosophy," neuroscience – by which I mean the traditional studies of neuroanatomy and neurophysiology – as a branch of theoretical inquiry is in significant tension with these programs. That is because the very notion of theoretical inquiry as understood and practiced by philosophers and scientists inextricably belongs to what Sellars called "the manifest image" and is thus incapable of being incorporated into the "scientific image" without generating insuperable epistemological difficulties that threaten the very possibility of such inquiry. As such, the naturalistic (i.e., materialist and determinist) presuppositions of cognitive science and neurophilosophy systematically undermine all natural science, including the neuroscience that they hope to use as a basis for their speculative philosophical constructions. In so doing, they undermine themselves as well.

This is a surprising result for such a well-received view. At the same time, it seems to many to be a foregone conclusion that traditional Cartesian dualism is neither in the spirit of, nor even compatible with, the claims made on behalf of neuroscience. Here, however, we must divide cases. On the face of it, I see no reason to suppose that substance dualism is in any way incompatible either with the pursuit of neuroscientific research or with any of the substantive results that have emerged from that research. Certainly, there are ambitious claims made for the promise of neuroscience, mostly by philosophers and "cognitive scientists," concerning the nature of consciousness, mind, personhood, and much else. Most of those who promote such claims are decidedly hostile to substance dualism, but as I have argued elsewhere, we have little reason to believe these claims and, in fact, could not have such reasons, even in principle, as I explained in a number of my previous papers.[1]

In this paper, I propose to provide an answer to the question that served as the title for the last, i.e. "How is Neuroscience Possible?" I shall argue that, in order for it to be possible, we must first abandon the naturalistic presuppositions of neurophilosophy and "cognitive science:" Galilean physicalism, materialism, and determinism. Then, we must replace these naturalistic doctrines with their non-naturalistic antitheses: the ontology of material things, substance dualism, and freedom of the will. On this alternate picture (which admits of many different

[1] See, for example, "The Consequences of Neurophysiological Determinism," "The Strange Case of Doctor Deville, or Determinism and Rationality," "Can I know what I am ThInking?" all posted to this website.

versions and much further development, so I claim no exclusivity or finality for the version presented here), indeed natural science as a whole, finds a natural home. Even if it must accept a somewhat chastened role in the exploration of the phenomenon of mind, the neuroscience actually done by neuroscientists will be at least possible and its discoveries genuine contributions to substantive scientific knowledge. That will have to do, just as it has largely done for actual working neuroscientists up to now.

Physicalism Must Go! When contemporary philosophers see the word "physicalism," they automatically think of physicalism about mind, the thesis that mind is nothing but a brain-process, ultimately reducible to or wholly dependent on, physical processes occurring in a wholly physical brain. That, however, is not the sort of physicalism I am attacking here – at least not directly.[2] Instead, I am attacking a view that has become so ingrained in our contemporary consciousness that it goes for a foregone conclusion and is never even so much as questioned. This view I call *Galilean Physicalism* (GP) or *physicalism about the external world*. I am persuaded that it is this commitment to GP that generates the problem of the external world and the epistemological crisis that still bedevils Western philosophy. The basic problem is that GP cuts us off from the external world in such a way as to make knowledge claims about that world so problematic that neither common sense realism nor scientific realism can be sustained in the face of skeptical challenge. When pushed to the limit, GP is epistemologically self-undermining, and in so being, undermines science itself, understood as the branch of theoretical inquiry charged with discovering substantive truths about the extramental natural world.

In the case of neuroscience, for example, we find a familiar story played out. Neuroscientists depend on the senses to investigate the brain, which they perceive as a bodily organ consisting of various tissues and structures by means of which the brain is able to function in various ways that contribute to the overall economy of the living organism, the body, of which it is a part. Everything that we know, and even can know, about the brain is derived, in the last analysis, from the findings of neuroanatomy and neurophysiology. Yet, according to GP, the real or *noumenal* brain, is nothing like the brain as it appears to us in consciousness *via* sense experience. The real brain is simply a collection of atomic and subatomic particles externally related to each other by certain forces and interacting with each other in accordance with the laws of motion. Like Eddington's two tables, GP seems to present us with two brains, one a bodily organ, the other physical object with purely physical properties. Given GP and the standard practice of preferring what Sellars called the Scientific to the Manifest image, we have to affirm the claim that, if either brain is the real brain, it is surely the latter.[3] In that case, however, the status of the brain as apprehended by the senses – call it the *phenomenal* brain – suddenly becomes problematic. Neuroscientists take themselves to be studying the real brain. Yet given the notion that the real brain is a physical object and thus beyond being apprehended *as such* by the senses, the phenomenal brain we apprehend by means of the senses can at best be a subjective, mind-dependent set of sense-data existing only in consciousness, a sort of mental image of the noumenal brain. In that case, we face all of the familiar epistemological problems associated with the realism of Descartes and Locke. Since we have no access to the noumenal

[2] I am attacking it indirectly only in the sense that physicalism about mind is often seen as the final, last detail needed to carry the Galilean physicalist program through to completion. If we abandon GP, then surely this particular motive for pursuing physicalism about mind ceases to apply.

[3] See Sellars *fils* (1963), 1-40.

brain except through the phenomenal brain, how do we prove that the noumenal brain even exists, let alone that the very different phenomenal brain accurately represents it? Since there is no way for us to access the noumenal brain as such and so compare it to the phenomenal brain to which we do have access through sense perception, it would appear that these questions are unanswerable, even in principle. If one were to adopt a skeptical, or instrumentalist, interpretation of neuroscience, I think it would be very difficult to show that this view was untenable. It would be even more difficult to establish that neuroscientific realism is a tenable view.

Galilean Physicalism is a philosophical, indeed an ontological rather than a scientific, thesis. Many people, including Galileo himself, seem to have thought that GP is the only, or at any rate the most natural ontology for natural science. However, as I have argued that Descartes was at least inchoately aware and has become increasingly obvious to contemporary metaphysicians, quite the opposite is the case.[4] In that case, the epistemological difficulties that so many people tend to dismiss as at worst just skeptical sophisms and at best merely philosophical problems that, like all philosophical problems, can be deferred indefinitely instead indicate that there is a significant logical tension between the practice of natural science and the GP ontology. If I have said enough to persuade the reader to take this worry seriously, this may be an appropriate time to suggest an alternative.

The Ontology of Material Things Fortunately, a number of contemporary metaphysicians have been exploring the idea of rehabilitating an ontology of material things, largely upon neo-Aristotelian lines.[5] According to this view, material things are not only real but also ontologically fundamental. Material things, the intentional objects of the mental events and acts dependent on, on sense perception, are composite substances, consisting of form or *structure* and matter. The epistemological significance of this view is as follows. Material things are present *in* and *to* consciousness by virtue of their substantial forms, which forms are present in things as their natures and in a different way in the mind, so that the form as known is numerically identical with that form as it exists in things. Thus, in apprehending/knowing the content of my own mental act of sense perception, I at the same time apprehend/know that material thing of which I am thereby aware *formally* and *intentionally*.

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[4] See Duncan (2008) chapter 1. Peter Van Inwagen and Trenton Merricks have argued (both assuming that GP is true) that physical objects cannot have proper parts and that therefore material substances (a class of entities that would include what we usually take to be the brain) do not exist. James Ladyman and his associates have argued that, if we are genuinely interested in basing our ontology on natural science that not even physical objects exist in the last analysis. See Van Inwagen (1990), Merricks (2001), and Ladyman *et al*, (2007). The full references forthese works are given in the bibliography to my previous paper "How is Neuroscience Possible?" also posted to *PhilPapers*.

[5] Among these philosophers, I might mention E. J. Lowe, David S. Oderberg, Lynn Rudder Baker, Amie Thomasson, Kathrin Koslicki, and Crawford Elder. (See the bibliography for this paper; the works listed are simply exemplary rather than representative or exhaustive.) I in no way want to suggest that these (and allied figures) constitute a school or movement, or that they would altogether agree with each other even on their basic outlook. Especially, I in no way wish to suggest that any of these figures would endorse any of the things that, after the next sentence in the text, I will offer by way of a suggestion for implementing this program. These ideas are entirely my own and cannot in any way be blamed on the aforementioned – or anyone else, for that matter. Neither do I agree with everything these figures have written. Although I resonate strongly with neo-Aristotelianism in metaphysics, I am still a Cartesian dualist and thus more inclined to side with Plato than with Aristotle on some key issues. The main attraction of these views is their role as providing a plausible alternative to Galilean Physicalism in ontology.

To the extent that *matter* (Aristotle's material cause) is also perceptible, it too is material substance and a composite of form and matter. However, matter as understood by modern physics is not apprehensible and is conceivable only as a Lockean *substans* or *substratum*. What I call physical *objects* are theoretical entities, and as such are explanatory posits that represent our best attempts to model the noumenal world consisting of the "hidden natures" of material things using the imagination, the scientific method, and the clues provided for us by sense-experience. The descriptions we offer of these noumenal entities neither are pure fictions nor literally true, but instead schematic, analogical *models* of those hidden natures.[6] These models, whether based on analogies derived from the senses or mathematical in nature, aim to be structurally isomorphic to what they describe and in so doing capable of both explanation and prediction within the realm of sense experience. To reach explanatory bedrock, such models must *posit* some sort of ultimate level of entities existing as *simple* substances, possessing simple properties, relations, and subject to the smallest possible set of simple laws.

Whatever can be apprehended and in that sense known by us through sense perception is the consequence of the presence of substantial form in and to consciousness. What modern science calls matter (ideally, a set of uniform simple substances possessing only quantitative properties, related to each other by simple forces, and interacting in accordance with mechanical laws of motion) is not perceptible as such, and thus not capable of being directly apprehended or known by us. However, unlike Descartes and Locke, we must not assume that nothing can be known except what can be directly apprehended.[7] The great success of the scientific method in modeling external reality in an illuminating way shows that this is false. While nothing can be comprehended by us without first being apprehended by means of the senses, it does not follow that only what is apprehended can be plausibly said to be known – or knowable.

Applying the foregoing to the brain, the following picture begins to emerge. The brain *qua* bodily organ is a material thing and constitutes the real brain. In sense perception, the brain's substantial form, which exists in it as the brain's structural principle or nature, comes to exist in consciousness in a different way, as the unifying, structural principle of the sense content of the mind's perceptual act when the brain is observed and studied. In so doing, it exists in consciousness in a manner isomorphic to the way it exists in the thing itself. In this way, the brain *qua* material thing is formally and intentionally present in and to consciousness and thus apprehended/known. In the same way, the *matter* of the brain, i.e. the tissues and structures studied by neuroanatomy, as well as the functions and processes studied by neurophysiology, are also apprehended. In this way, they known by neuroscientists through the senses, and thereby made capable of being theoretically comprehended by them as well. Although neuroscience needs no more than this to be possible as a *bona fide* science, using the general categories of physics as adapted to the particular context of the brain *qua* material thing, it is also possible to reconstruct the brain as a physical object and its structures and processes as physical processes as well. In so doing, neuroscientists are attempting to provide a *model* for the noumenal brain, at least insofar as the part of the brain that is hidden from sense-experience can be plausibly conjectured and reconstructed from what we do experience through the senses. Since this reconstruction is limited, partial, and analogical rather than fully literal, this will not do as a

[6] See, on this point, Hesse (1965) and Barbour (1974).

[7] See Locke's *Essay*, Part IV, where he expresses both pessimism and skepticism about our ability to penetrate the secrets of nature, even by means of natural science.

"reduction" of the brain to a physical object, which somehow supersedes or makes the brain *qua* material thing ontologically superfluous. There is no bar, however, to our accepting the well-confirmed results of such an inquiry as an indirect, if partial, apprehension of the brain *qua* physical object by means of a theoretical construct.

There are not, on this view, two brains, one phenomenal and the other noumenal. There is only one brain, a composite substance consisting of form and matter, and two ways of knowing it: perceptually, as a material thing, and theoretically, as a physical object. The "phenomenal" brain is simply the brain as apprehended by the senses, and the "noumenal" brain the brain as comprehended according to the categories of physics. These are simply two different ways of looking at the same thing, one literal and epistemically fundamental, the other analogical but still our best account of the brain's *ultimate* but hidden constitution. The two pictures thus complement, rather than compete with one another, and there is ample room for everyone to engage in his or her preferred mode of theoretical inquiry without stepping on anyone else's toes. At the same time, no one gets the privilege of proclaiming that his or her perspective supersedes all others or makes the other's research superfluous.

Materialism and Neuroscience The second great epistemological bugbear threatening the possibility of neuroscience is materialism about mind, according to which consciousness and all its states and contents are either nothing but or wholly dependent upon purely physical states of the brain externally related to one another merely by mechanical efficient causes. The essential difficulty is a version of the problem of mental causation applied to our own thoughts. If any science, including neuroscience, is to be possible, it has to be the case that we can engage in theoretical inquiry. This, in turn, presupposes that we can arrive at well-confirmed beliefs on the basis of observation, experiment, and sound logical reasoning. The difficulty arises from the fact that, if materialism is true, we can always provide a complete causal explanation for any mental state in terms of purely physical, non-rational causes occurring in the noumenal brain. Data, reasoning, and evidence are thus disbarred from contributing *as such* to the formation of our judgments and beliefs. Instead, they will be capable of so doing only insofar as judgment and belief were produced by the brain state with which these reasons are to be reduced or upon which they supervene. In either case, this will simply be accidental and fortuitous from the physical point of view. Given this, neither evidence, reasoning, nor argument, considered in themselves or as such, contribute in any way to what I end up believing.

For the same reason, neither is data, reasoning, argument, etc., capable of epistemically justifying my judgments or beliefs in order that they might be rational. My judgment that a particular argument is valid and sound and thus justifies its conclusion, being itself either nothing but, or wholly supervenient upon, a purely physical state of the noumenal brain, will be itself the product of wholly physical causes existing in that brain, just like every other mental state. Once again, my putative apprehension of the argument and its logical properties either played no role at all in my arriving at my judgment, or did so solely in virtue of its association with a purely physical brain state, hence only accidentally and fortuitously as the byproduct of a purely physical process occurring in the noumenal brain. In no way, then, is that judgment the product of any sort of rational process considered as such, in the manner we usually conceive of it.

If science is to be possible, theoretical inquiry, the pursuit of truth for its own sake, must be possible. In turn, theoretical inquiry will be possible only if rational belief is possible as well. For rational belief to be possible, it has to be the case that data, evidence, reasoning, and

argument play the leading, indeed, to greatest extent possible the *exclusive* part in determining what we come to believe. It has to be possible for me to assent to the truth of a proposition solely on rational grounds, without the interference of any non-rational, merely efficient causal conditions. In this sense, the operation must be *autonomous*, just as we normally take it to be when we engage in philosophy, natural science, or any other form of intellectual inquiry.

The neuroscientist, for example, supposes that, in engaging in scientific research he or she is discovering the substantive, empirical truth about the how the brain works and what it does. What a surprise, then, to discover that this view must be mistaken if materialism is true. The neuroscientist's careful observations, elegant experiments, well-confirmed findings, and rationally compelling arguments are all, if materialism is true, no factor at all in determining what he or she believes, except insofar as purely physical processes going on in the noumenal brain with which they are associated have played a purely mechanical, efficient causal role in producing those beliefs. From the physical point of view, the presence or absence of those mental contents makes no difference to the causal processes that produce those beliefs. The neuroscientist, then, utterly lacks rational autonomy even as he or she pursues the substantive truth about the brain. The noumenal brain, by sundering any connection between beliefs and the reasons that justify them, simply will not allow it. A neuroscientist who is also a materialist must come to the conclusion that reason, as such, is an illusion, and in the end, that the very science that he or she practices, being a product of reason, is an illusion too.

I have discussed various attempts to evade this conclusion at length elsewhere.[8] For now, I can do no more than hope that, given what I have said, the reader might be willing to entertain an alternative, at least hypothetically. Although this may well be false, I shall nevertheless proceed hopefully.

Dualism and Neuroscience If theoretical inquiry is to be possible, then rational belief must be possible as well. Rational belief will be possible only if reason is autonomous in its operation, so that it is possible for us to form our beliefs in accordance with evidence and argument rather than simply arrive at our beliefs solely due to the operation of non-rational, purely physical, efficient causal process occurring in the noumenal brain. By exploring the necessary conditions for the possibility of this sort of rational autonomy, we will also discover the necessary conditions for the possibility of theoretical inquiry, natural science and therefore, neuroscience as well.

In the first place, then, reason is surely an illusion if materialism is true, so the principal necessary condition for the possibility of rational belief is that materialism be false about cognition. This means that rational thought must be immaterial, in at least the minimal, negative sense that it is neither reducible to nor wholly dependent on physical processes occurring in the noumenal brain. Instead, the exercise of our cognitive faculties needs to be in some way independent of the influence of such causes, so that we can arrive at our beliefs on the basis of data, empirical evidence, inductive and deductive argument, and so on. This also means that mind, and the consciousness through which theoretical inquiry takes place and arrives at rational

[8] See the companion paper to this one. I have done so at still greater length in *Reason and Illusion*, an unpublished manuscript. Since I anticipate that many people will be resistant to this conclusion, I suppose that I will have to do so at even greater length on some future occasion if there is the opportunity. However, by now the intelligent reader can probably supply the appropriate critique for him- or herself without my help if only he or she has the interest to do so.

belief must be immaterial as well *so far forth*. This is a long way, of course, from showing that the mind is immaterial in the *positive* sense. However, it does at least suggest that this might be a metaphysical possibility. Here I can do little more than suggest the outline of a view that I hope to defend more fully elsewhere.

Let us begin with the idea of the soul as a simple, sempiternal, spiritual substance capable of only one simple, undifferentiated activity – *per se* causation.[9] Since the soul is not subject to space or time, this activity on its side or in relation to itself shrinks to a single, undifferentiated moment. In relation to the object upon which it exercises this power, i.e. the body, its act as *causa in esse*, serving as the metaphysical principle sustaining the body's operations through space and time, becomes localized in space and extended through time. In its act in relation to the body it sustains, the soul is an *endurant* entity, wholly present in and to each temporal moment at which it acts due to its body being extended in space and time (or "space-time.") The soul considered as such is a theoretical posit and knowable only through its effects.

The primary exercises of the soul's *per se* causality is in its role as the *principle of life* of the body. While the body *qua* material things has its own substantial form (encoded in its DNA), the soul is the substantial form of the body *qua* living organism, i.e. the composite substance composed of and by both soul and body. Hence, the soul is the principle of substantial unity of the body and principle of its ongoing organic operations and does this through being the *per se* or sustaining cause of the body's organic operations. The presence of the soul accounts for the organism's property of being "self-organizing," i.e. being able to maintain the same pattern while incorporating new parts, regarded since Aristotle as a primary difference between living and non-living things. This power it exercises independently of consciousness and its operation in this regard is not accessible to consciousness.

Consciousness is the interface between the soul and the body by means of which the soul is able to monitor the body's state and condition, and by means of this to interact with the external world of material things. Consciousness is an intentional field of awareness that, while immaterial, is neither wholly in the soul nor wholly in the body, but constituted by both soul and body, each of which contributes necessary conditions for its existence. Consciousness arises due to the fact that the soul is present to the body, and capable of monitoring changes in it. Some of these changes are the consequence of changes in the body that hamper, retard, or interfere with the soul's ability to exert uniform *per se* causation with regard to its operations. Others are changes that are the result of interaction with other bodies, producing changes in the sense-organs and bodily-based appetites, emotions, passions, etc., that once again affect the soul's influence on the body. Consciousness is thus a third thing serving to unite body and soul into a single subject of experience. The temporally and spatially ordered contents that appear in consciousness are largely the work of the body. However, since awareness belongs to consciousness due to the uniform, *per se* causal activity of the soul, it is the soul, rather than the body, which becomes conscious through its relation to the body.

A soul that has become conscious we can call a *mind*. Mind is a *perdurant* entity, existing for the soul *qua* substance simply as a power realized and exercised in the intentional field of consciousness as both subject and agent. The soul possesses the power intrinsically, but the realization and exercise of this power depends on conditions outside the soul, and in particular,

[99] I have discussed this at greater length in a new book, *How Free Will Works*, forthcoming from Wipf and Stock.

in the body. Nevertheless, anything that has a mind is conscious, and thus counts as a *res cogitans*. Yet not all souls that become minds are rational souls. Non-human animals are conscious but non-rational, because they lack the power of *reflective awareness* of their own mental states. By contrast, a *rational* soul is one possessed of the power of reflective awareness, and thus capable not only of being conscious, but also of being aware of the fact of being conscious as well and of its own mental states, their properties, and contents as such.[10] A rational soul that has become conscious and so a mind is thereby present in this intentional field as a self-conscious subject, a *person* or *self* and possesses additional conscious powers as a result. The human soul, at any rate, is not always conscious or capable of rationality in all circumstances. For this reason it is not always actively a self, hence does not possess selfhood in all circumstances. Nevertheless, this power belongs to the rational, human soul by nature, hence is essential to it and thus present even when, due to external circumstances, it is incapable of being exercised. A rational soul lacking consciousness and selfhood thereby is deprived of something that belongs to it by nature, like an eye that is blind. Nevertheless, since personhood belongs to a rational soul by nature, on this view, a rational soul is a personal being even when it is not a self, due to some accident adhering in the body, such as having an undeveloped brain, being asleep, or even being in an irreversible coma. As such, a rational soul is still a person, even when it lacks active selfhood. In this way, we can thus concur with Boethius' definition of *person* as *an individual substance of a rational nature*.

That we are capable of apprehending the contents of consciousness, and by means of them extramental things, is due to the fact that both the body and the things with which the body interacts are material things, composed of both form and matter. We cannot apprehend matter as understood by modern science by means of the senses. However, since substantial forms are capable of becoming *intentional species*, existing in various media, including the intellect, without becoming the natures of those things, it is therefore possible for us to apprehend material things through apprehending their substantial forms. More than this, since these substantial forms are immaterial, they are connatural to the conscious mind, and are thus capable of being the contents of consciousness. As Aristotle says, the intellect is potentially all things through the presence of their substantial forms in us.[11] Thus, viewed functionally, the purpose of the brain and its activities is to convey these substantial forms to consciousness, especially by means of the brain and its states and processes: it literally "in-forms" us through its activities.

On this view, the body is a machine that has evolved to serve the needs of consciousness, and this is especially so in the way in which the brain has evolved. It is, I believe, much less likely that consciousness is some sort of accidental byproduct of the evolution of the organic brain than that the presence of consciousness itself is the primary factor in the brain's evolution. Human evolution, then, is not just about physical survival or differential reproduction considered as an end in itself. Indeed, very little of what human beings do, at least in ordinary circumstances, is plausibly explained by direct reference to these ends and few of the things that are so explicable would be worth continuing to do if the evolutionary account of these matters were to be accepted. After all, not even the most ardent evolutionist spends his time trying to have as many offspring as possible! All enjoyment and everything that we can think of as worth having or doing is in some way related to and dependent on consciousness, and whatever

[10] For more on this, see my paper, "Could Introspection be Unreliable, even in Principle?" posted to PhilPapers.
[11] DA 431b20-29.

promises to expand our capacity for conscious experience, whether in terms of intensity, range, or variety, naturally recommends itself to every sentient creature. In beings capable of self-consciousness, the pursuit of various kinds of intrinsic goods, capable of trumping the pursuit of sensuous pleasures and even overcoming the fear of death is widely recognized and prized by human beings.

From this point of view, the brain's role in cognition is to serve as an information processor, as the means through which substantial forms are made accessible to the rational soul, *qua* self-conscious subject, in consciousness. It does this by encoding the substantial forms of material things as the structural principle of perceptual brain states, and storing them the physical memory for further use. The brain does all this without being in any way aware of its doing so, for the brain is not conscious, nor is it even alive through its own act. Nevertheless, it plays an essential role in making consciousness possible, and is the source of all of our spontaneously arising mental contents, including our judgments. Only neuroscience, not philosophy, can tell us this part of the story, so I shall say no more about this here.

Thought is only possible if there is something to think about, and this is supplied by the brain through it introduction of substantial forms into consciousness. Both the forms themselves, and the thoughts about them, are immaterial. As such, we can learn no more about cognition by studying the brain than we can about Beethoven's Ninth Symphony by studying the various states and processes occurring in our stereo components when we are playing a recording of that work.[12] At best, brain activity and processes are necessary, not sufficient, for cognition. Further confirmation of this lies in the fact that the primary contribution of neuroscience to our understanding of cognition is in exploring how various kinds of brain diseases and illnesses affect our cognitive capacities by preventing the necessary conditions for normal, healthy cognition to occur. In this regard, the greatest interest and promise of neuroscience lies where it has traditionally been seen to lie – in the field of medicine as the basis for research intended to heal defects and traumas in the brain *qua* material thing so that, among other things, perception and cognition will be possible for those with mental deficiencies and injuries.

Much more than what I have said here is needed in order to make what I have said here even remotely plausible to most modern philosophers. This is not the place to say it. I only note that a dualist need not deny the necessity of the brain for consciousness, and especially for successful cognition. Nevertheless, the autonomy of reason needs to be preserved, on pain of undermining even the very possibility of neuroscience. To this topic we must finally turn.

Neurophysiological Determinism and Free Will As I have argued at length elsewhere, if the thesis known as neurophysiological determinism is true, then all of my thoughts are determined

[12] I owe this image to a paper I read many years ago by the NZ philosopher Gavin Ardley, the reference for which I have been unable to find. It is especially apt, since even though the *performance* of Beethoven's Ninth that we hear when we play the recording is *utterly* supervenient on the non-musical processes that produce it, the study of those processes has absolutely no significance for or relevance to our understanding of that performance as either a piece of music or a work of art. The same holds, I contend, for the relation between the study of cognition (or more simply, "thought") and the brain. If the stereo (or whatever) fails to function or to function as it was designed to do, then no proper performance will be heard; so too will thought be impossible if the brain cannot function or if its operation is defective. It does not follow that thought is nothing but a process occurring in the brain, or some process completely supervenient upon the functioning of the brain, or even usefully investigated by investigating the brain-processes that make thought possible for a finite mind.

by non-rational, purely physical causes over which I have no control, exert no direction, and have no power to review. As such, whatever beliefs I arrive at, my arriving at them was something completely predictable from purely physical causes operating in my brain long before I even undertook my course of theoretical inquiry. Further, since those all-disposing purely physical causes existing in my brain are at best only accidentally related to sound reasoning, I have no reason to believe the results of those inquiries once I know how they were produced. Neither am I in any position to confirm those results or verify them by further examination, since whether I make such an examination, as well the results that I arrive at after doing so, were already determined by forces outside of my control. If I was determined to persist in my belief after reexamining it, or to change my mind, then I do so ineluctably, regardless of the facts of the matter. In that case, these results are no more trustworthy than those I originally arrived at, and no matter how many iterations of this process of examination I have been determined to engage in, the difficulty remains. The same, of course, will hold of specific forms of theoretical inquiry, such as neuroscience.

Although there are various ways in which defenders of determinism attempt to evade these implications of their view (when they actually engage them rather than simply dismissing them with scorn) I contend that none of them is successful.[13] If I am right, then the very possibility of rational belief and theoretical inquiry requires that belief in the substantive truth of a proposition must be a free act, made solely on the basis of reasons without interference from non-rational causes existing in my brain. Thus, rational belief and theoretical inquiry of all kinds, including neuroscience, are possible only if we have free will. However, since the brain is a machine and completely subject to the laws of nature, it follows that the brain is incapable of free choice. If we are to have free will, then, it must be the case that the soul as conscious and self-conscious mind exercises the power of free choice with regard to our beliefs. Thus, just as rationality presupposes free will, so also free will presupposes the existence of an immaterial soul that exercises that power of agency. In other words, if rational belief is to be possible in any field, including neuroscience, then either substance dualism, emergent naturalism, or idealism must be true.

It is sometimes argued that we do not, in fact, possess the power to believe or not believe at will. However, we need not interpret doxastic voluntarism as requiring this sort of Sartrean freedom. Instead, it is enough for our beliefs to be product of free, rational assent that it be possible for us to suspend judgment (in the sense of assent to the truth of) to any proposition. As Descartes and Hume show, this ability to suspend judgment in this way extends to any belief we possess about which we might even possibly be wrong, which includes nearly all of our substantive beliefs. In most cases, we form our beliefs against the background of evidence that is less than logically compelling, and to which other rationally defensible alternatives exist. There can be no serious question in such cases that the judgments we make, viewed against the background of evidence and alternatives available to us, are free and the exercise of autonomous reason. If this were not so, then we could not be subject to doxastic obligation and willful irrationality – of which we strongly suspect philosophers who disagree with us – would be impossible.

[13] See my "The Consequences of Neurophysiological Determinism," posted to this website.

I have elsewhere discussed the interaction problem for Cartesian dualism and offered my solution to it. Since the brain exists to process information and convey the forms of things to the mind in consciousness, its states and processes reflect those forms and their relations to one another. As such, these processes produce both spontaneous judgments and spontaneously arising lines of thought in consciousness tending to favor the various alternatives that (typically involuntarily) occur to us. The discipline of theoretical inquiry, constituted by the laws of logic and the canons of proper method, give us criteria for considering some alternatives and rejecting others, which neither need nor admit "correction" by neuroscientists, who depend on these same laws and canons to accomplish their own work. Such laws and canons, then, are clearly autonomous norms of thought presupposed by all theoretical inquiry of whatever kind, including neuroscience. In turn, these norms of thought sometimes conflict with our previous habits of thought. We manage our thoughts by selecting which to sustain or continue through the power of *per se* causation inherent in the soul. When we decide what to believe in accordance with logic, the canons of theoretical inquiry, and the preponderance of evidence, we are rational so far forth. When we either form beliefs independently of those canons or believe against the clear preponderance of evidence, we are willfully irrational, and since it was within our power to have done otherwise, we are rationally blameworthy for having done so. In many cases, however, the evidence is not dispositive for one side or the other; in such cases, more than one view may be rationally respectable those who hold different views equally entitled to their positions.

If neuroscience is to be a science, and therefore an exercise in theoretical inquiry, qualified researchers must undertake it with the end at arriving at the truth about the brain. These researchers, in turn, must be competent inquirers, and thus capable of applying the canons of theoretical inquiry to the pursuit of the study of the brain, its structures, and processes as well as forming their beliefs in accordance with those canons. This, in turn, requires that they possess rational autonomy and thus be capable of *freely* assenting to the truth of propositions on the basis of observation, evidence, and rational argument. This, in its turn, requires both that their beliefs not be the product of the operation of non-rational, purely physical causes existing in the brain and that we be capable of withholding assent, even from propositions to which we currently consent. Thus, if neuroscience is a genuine science and neuroscientists capable of rational belief, then neuroscientists possess free will as well. In short, then: if neuroscience is to be possible, then natural science must be possible. Natural science, in turn, will be possible only if theoretical inquiry is possible. Theoretical inquiry, however, will only be possible if rational thought and discourse capable of arriving at rational belief is possible. This, finally, will only be possible if reason is *autonomous* in its operation. As we have seen, however, reason can be autonomous in the relevant sense only if physicalism, materialism about mind, and determinism is false and the brain has evolved to serve the needs of consciousness rather than merely producing consciousness as a kind of incidental effect or accidental byproduct. As such, neuroscience is possible only if so-called "cognitive science" and neurophilosophy are false. That is my final conclusion.

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