

Chapter 2

Return of the Repressed: Spinozan Ideas in the History of the Mind and Brain Sciences

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We know ourselves to be part of the totality of nature.

—Spinoza, *Ethics* 4apdx32

2.1 Introduction

Our contemporary understanding of the “hard problem” in the mind and brain sciences is rooted in a general conception of science as the reductive study of physical matter that originates in seventeenth-century efforts to develop a viable alternative to the scholastic synthesis that had permeated western education and thought for the previous 500 years. Continental philosophers like René Descartes (1596–1650), as well as British Atomists and Empiricists like Thomas Hobbes (1588–1679) and Thomas Willis (1621–1675), sought to establish a new paradigm for natural philosophy, which included an understanding of the relationship between our psychological experience and a mechanist physics. For all of them, scientific accounts had to be limited to a kind of causal analysis in the modern sense that equates *cause* with what the scholastics would have called *efficient cause*, and they all rejected any appeal to final or teleological causality. These, of course, are all important values in contemporary science, and such seventeenth-century natural philosophers are easily construed as standing at the beginning of a relatively linear narrative connecting their insights to the contemporary paradigm. It is because of their inaugural role in the creation of contemporary science that they are remembered and that their ideas still seem reasonably familiar, in spite of the 300+ years that have elapsed since the beginning of the early modern period.

Benedictus de Spinoza (1632–1677) was engaged in the same early-modern quest for an alternative to scholasticism, but his approach was sufficiently different

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from that of the Cartesians and Empiricists that an account of the role of his ideas in the history of science, and specifically of the mind and brain sciences, does not fit well into what might be considered the canonical narrative. As will be discussed below, his ideas were perceived by his contemporaries as far more radical than those of other natural philosophers, and as a result, they were condemned by both civil and religious authorities and marginalized within the intellectual community.¹ Recently, the limitations of the Cartesian/Empiricist approach have led many neuroscientists, particularly those working on consciousness and mind/brain relationships, to consider quite Spinoza-like models,² and one major researcher, Antonio Damasio³ has explicitly acknowledged Spinoza as a major influence on his work. For the most part, however, the neuroscientific progress of the intervening centuries was accomplished without much reference to his work. The pattern of Spinozan influence in the history of the mind and brain sciences, thus, is less a linear narrative than what the Freudians might describe as a “return of the repressed.” And, as the initial suppression of his ideas affected not only the mind and brain sciences, but also the development of the broader intellectual culture, Spinoza’s philosophy is often considered more problematic for contemporary readers⁴ than the more dominant ideas of thinkers like Descartes or John Locke (1632–1704).

Methodological reductionism and mind/body dualism, both of which Spinoza rejected, became central to classical scientific thinking, with mind/body dualism achieving such hegemony that alternatives to it—e.g., the idealism of George Berkeley (1685–1753) or the radical *materialism* of Julien Offray de La Mettrie (1709–1751)—were largely conceptualized in terms of a forced choice between incorporeal mind or inert matter. What Spinoza suggested as an alternative was a suite of ideas, the most important of which (for the present purposes) are holism, dual-aspect monism, and, derived from these two, a notion of mind/body relations that defines human affects as changes in the organism’s ability to sustain itself. The intent of this chapter is the explication of these three ideas, as they appear both in Spinoza’s philosophy and in subsequent neuroscientific work. To that end, the chapter is divided into two main sections: the first, an account of how they appear in Spinoza’s thought, and the second, an effort to capture the historical return-of-the-repressed narrative that accounts for the reemergence of a Spinozan perspective in the mind and brain sciences in the latter part of the twentieth century.

2.2 Spinoza’s Philosophy

When contemporary readers find Spinoza difficult to understand, it is largely because his ideas run counter to the hegemonic, Cartesian (and Empiricist) paradigm. The task of interpreting Spinoza is made somewhat easier, however, by the

¹ Israel 2001.

² Ravven 2003.

³ Damasio 2003.

⁴ Cf. Allison 1975.

fact that his major philosophic work, the *Ethics*, was a relatively explicit critique of Descartes: a circumstance that allows us to use our familiarity with the latter to elucidate the former by way of contrast. The most important point at which such a contrast can be made is at the level of first principles, which for Descartes begins with his famous: “I am thinking, therefore I exist”: the “clear and distinct idea” at which he arrived by means of his equally famous reductive method of hyperbolic doubt.⁵ This Cartesian *cogito* is a principle with a great many ramifications, but for our purposes, there are two that are of particular importance. First, it implies a distinction between the human mind, which it asserts to be knowable by direct intuition, and everything else that the mind encounters. And, second, it asserts that this self-evident mind is the mind of the individual knower. This, of course, is a remarkably solipsistic principle; Descartes can only resolve “the hard problem” of connecting this self-awareness to other forms of knowledge by way of separate and additional claims about the existence and goodness of God.⁶

2.2.1 *Nature as a Whole*

The Cartesian *cogito* was intended as an intuitively certain fact on which the rest of Descartes’s philosophic and scientific work could be grounded. In today’s intellectual climate, few sophisticated people expect the kind of certainty that Descartes sought, but this goal was a pervasive one among the early-modern thinkers who were looking to replace the once universally accepted scholastic synthesis. It is a goal unquestionably shared by Spinoza, who begins his *Ethics* with a series of what he considers intuitively certain definitions, the most important of which is that of Substance: something “whose concept does not require the concept of another thing from which it must be formed” (E1d3).⁷

The term *Substance*, like many of the terms used by Spinoza—as well as by Descartes and others of their contemporaries—is adapted from scholastic technical vocabulary and does not carry much meaning in contemporary discourse,

⁵Descartes 1637/1996a.

⁶Ibid.

⁷de Spinoza 1677/1985, E1d3. Abbreviations for the subsections in Spinoza’s *Ethics*: Definitions (d), Axioms (a), Postulates (pos.), Lemmas (l), and Propositions (p), which have Corollaries (c), Scholia (s), and Demonstrations (dem). In addition, there are introductions and appendices to some of the Parts. Citations in this paper will first list the Part number, followed by a letter designating what type of subpart is cited, followed by its number. Thus, E2p1 refers to the first proposition in Part II. Where more than one section is referenced, a comma should be read as “and.” Thus, E2p1,2 refers to Propositions One and Two in Part II. Corollaries and Scholia are associated with propositions as in E2p32c1 (Part II, Proposition 32 Corollary 1) or E2p40s1 (for a Scholium). References to the Postulates, Axioms, and Lemmas that follow E2p13 will be indicated by an accent mark; thus E2a1’ refers to the first axiom in this section. Subdivisions of Introductions and Appendices will be transparent on their face. Direct quotations in the text are from Curley’s translation (de Spinoza 1677/1985). The translation in the epigram is my own.

particularly the discourse about consciousness. In this context, however, the precise meaning of the term is less important than the breadth of its connotations, the role it plays as the foundational element in Spinoza's philosophy, and the contrast between it and the minimalist "consciousness of self" upon which Descartes grounds his system; where Descartes begins with certainty of self, Spinoza starts with certainty about this all-encompassing Substance of which, he will later argue, all singular or particular things are parts or aspects. In his technical vocabulary, singular things—including conscious selves—are *modes* or *modifications* of the totality,⁸ which is both logically and causally prior to any singular thing (E1p1).

The implications of these contrasting starting points are important. As has already been noted, the reductive *cogito* does not lead the doubter to knowledge of anything outside of itself, and as a result, Descartes is forced to introduce additional fundamental ideas including that of an omnipotent and benevolent God who serves as guarantor of the truth of all other ideas that can be described as clear and distinct.⁹ Yet another fundamental idea—made necessary by the fact that the thinking self is arrived at only after doubting the physical self—is a mind/body dualism so radical that each part is conceived as separate and distinct substances. Spinoza's intuition of an all-inclusive Substance is one that precludes the possibility of there being anything outside of itself: including anything—like Descartes's God—that might have created this whole. (E1p6c). Substance, for Spinoza, is "the cause of itself" (E1d1).

In the scholastic terminology with which Spinoza's contemporaries would have been familiar, however, the condition of having the quality of being self-caused (*causa sui*) is a definition of God.¹⁰ Thus, rather than being created by God, Spinoza says that the totality of which everything is a *mode* or part, is God; and, throughout the *Ethics*, he refers to this totality as "God or Nature" (*Deus sive Natura*). This equating of God and Nature, however coherent it may have seemed to the scholastically educated, is not unproblematic, and there has been considerable disagreement about how far Spinoza meant the idea to be taken. To his own generation and their successors for the next 100 years, his definition of substance as *causa sui* was not sufficient to outweigh his rejection of an independent Creator, and he was thus universally condemned as an atheist.¹¹ But, to the German Romantics who rehabilitated his reputation in the late eighteenth century, he is a pantheist and a mystic.¹² Present-day opinions on this question depend on variations in one's definition of pantheism, but I am inclined to accept the assessment of his contemporaries and read the theistic language as an artifact rooted in the technicalities of the scholastic terminology, which was the only philosophic language available at the time.¹³

Questions about Spinoza's atheism are, for the present purposes, arresting but not central. What is more important is the rejection of reductive method implicit in his

⁸ de Spinoza 1677/1985, E1d5.

⁹ Descartes 1637/1996a.

¹⁰ See, e.g., Aquinas 1270; *Summa*, I, q.2, a.3.

¹¹ See Gullan-Whur 2000; Israel 2001; Nadler 2001.

¹² See DeCuzzani 1991; Goetschel 2004; Jacobi et al. 1916/2010.

¹³ Cf. Nadler 2011.

notion of Substance. For Descartes and the vast majority of his contemporaries who adopted an explicitly atomist perspective,¹⁴ natural philosophy was, at root, caused by the behavior of some kind of fundamental particles—atoms or corpuscles—out of which all natural things are made. All natural phenomena are reducible to such parts, and, ultimately, only intelligible in terms of them. Causality, for the majority of the early moderns, operated—as it were, from the bottom, up—with complex phenomena explained as the effects of simpler and more fundamental particles and processes, which were seen to be their causes. For Spinoza, however, because he begins with the self-evidence of substance, causality is as much a top-down as a bottom-up phenomenon, for natural objects are unintelligible except in terms of the whole. Because he, like all his non-Scholastic contemporaries, rejected the idea of teleological causes in favor of a mechanistic explanation for the interaction between singular natural objects, he does have a conception of the sort of linear causality that is more familiar to contemporary sensibilities. But the relationship of particular things to the totality of nature is, for him, more important than their interrelationships, and he only begins his discussion of singular or particular things in Parts II-V of the *Ethics*: after he has established his conception of the, causally active, totality of nature (*E1p23,25*), as clearly and completely as he feels he can.

The essential elements of his concept of Substance, in addition to the idea of its being *causa sui*, are that it exists necessarily (*E1p7,11*), is infinite and eternal (*E1p8*), as well as unitary (*E1p12*) and unique (*E1p14*). Most important for present purposes, it is essential for an understanding of Spinoza's conception of a unified totality—Mind and Body—that we realize he does not see them as separate substances as they are in Descartes.¹⁵ Neither, however, are they to be thought of as separate parts of the totality. They are, rather, what Spinoza calls *Attributes*: “what the intellect perceives of a substance, as constituting its essence” (*E1d4*). His doctrine of attributes is a complex one, but at its core is the assertion that each attribute constitutes the whole essence of substance, and the difference between them is a difference in conception: Neither one is the cause of the other (*E3p2*)—any more than one side of a coin is the cause of its obverse—and to speak of either is to speak of the whole.¹⁶

In contemporary discourse, we are accustomed to thinking of mind/body relationships in terms of particular minds, whether of humans, primates, or animals in general. Thus, Spinoza's meaning when he ascribes Mind to Nature as a whole is not immediately self-evident. Jonathan Bennett¹⁷ has argued that Spinoza wasn't really interested in the details here, but merely reasoned that, since human beings

¹⁴Technically, Descartes was not an atomist because he rejected the notion of a void. However, his idea that matter is essentially corpuscular has the same reductive implications as atomism, properly so called.

¹⁵Descartes 1637/1996a, 1649/1996b.

¹⁶In an insight that anticipates contemporary *n*-dimensional physics, he asserts that substance, being infinite, consists in an infinite number of attributes (*E1d6*), though the only two attributes human beings are aware of are Mind, or Thought, and Body (*E2p1, 2*).

¹⁷Bennett 1984.

think, we have to ascribe Mind to the totality of Nature in order to hold that human beings are natural things—which is to say modes of God or Nature. This is, I believe, a helpful way to bracket the question of Nature’s “psychology,” but it is also useful to consider Spinoza’s assertion, in *E2p7*, that “the order and connection of ideas is the same as the order and connection of things.” In this connection, Edwin Curley¹⁸ and Don Garrett¹⁹ have suggested that we think of Mind as the set of propositions that can be made about Nature. Spinoza holds, as it were, that Nature “makes sense,” and the sense that Nature makes is itself natural²⁰; and it is this natural “sense” that he calls Mind (with a capital “M”).

2.2.2 *Singular Things*

Spinoza’s most basic ideas about the nature of singular things are laid out in the set of Axioms and Postulates that follows *E2p13s*. This is a series of statements on the nature of bodies in which he asserts that bodies are either in motion or at rest, that they differ, one from the other, only in the speed and direction of their movement, and that the speed and direction of a moving body is determined by—and can only be understood in terms of—the given body’s interaction with other moving bodies. By the term *bodies*, in this initial context, he means simple uncompounded singular things roughly similar to the fundamental particles of reductionist mechanics: “corpuscles” in Descartes’s fluid mechanics²¹ or atoms in the works of Empiricists like Thomas Willis,²² who adopted Gassendi’s²³ revised Epicurean mechanism in preference to Descartes’s hydraulic model. But, this similarity with the fundamental particles of reductionist mechanics is deceptive, because Spinoza’s simple bodies differ from corpuscles or atoms in two important ways. The first of these is that, consistent with his notions of top-down causality, singular things are modes of the totality and are in no sense discrete fundamental particles (*E1p1*). Secondly, in Spinoza’s philosophy, the description of a specific moving body is not exhausted by an enumeration of the external causes of its speed and direction, because these causes do not account for the body’s own inertia or momentum—the fact that “each thing, in so far as it is in itself, strives to persist in its being”—what he calls the body’s *conatus* (*E3p6*).

For Spinoza, a body’s momentum or *conatus* is intelligible in terms of the body itself; it is, in effect, the actual essence of any singular thing (*E3p7*). This is a crucial point for two reasons. First, it is an assertion that bodies are not inert as they are for Descartes and the Empiricists. Second, Spinoza will argue that particular minds

¹⁸Curley 1969.

¹⁹Garrett 2002.

²⁰Meehan 2009.

²¹E.g., Descartes 1662/1996c; Gaukroger 1995.

²²Willis 1683/1971.

²³Gassendi 1972.

(with a lowercase “m”) are the ideas of particular bodies (*E2p13,13s*), and by saying that a simple body is intelligible in terms of its *conatus* or essence, he is identifying the idea or “mind” of that body.

The notion that there could be a “mind” of a simple moving body or particle, in and of itself, may seem incoherent, but it is important to bear in mind that, for Spinoza, nothing is ever just in and of itself; it is always part of something else. Ultimately, singular things are modes of the totality of Nature and must be, like Nature itself, intelligible in terms of both Body and Mind. In addition, simple particular things exist as parts of more complex singular things. Spinoza’s notion of bodies, thus, is not limited to simple bodies, and his conception of *conatus* is not limited to simple inertial movement. He tells us that any grouping of simple bodies moving in concert and in such a way as to be the cause of a single effect is a body with its own *conatus* in its own right (*E2a2*). In an observation that anticipates one of the central developments of twentieth-century neuroscience, he argues that the *conatus* of such a complex body is the internal dynamics whereby it maintains a pattern of relations among its parts. At the level of organisms, this amounts to homeostasis, and at the level of animals, it includes not only the internal homeostatic activity, but also the actions that the animal takes to provide itself with whatever it needs to maintain its life and reproduce. The relation between parts and wholes connects every singular thing to the totality of nature in a nested hierarchy of progressively more complex patterns. In contemporary vocabulary, we might say that organisms and animals exist as parts of ecologies, ecologies are organized into worlds, worlds into universes, and so on to the ordered totality of Nature. At each level of organization, there is, for Spinoza, an internal dynamic, a *conatus* or striving to persist in being.²⁴ Each of these, to the extent that they are spatially extended, are bodies in Spinoza’s sense of the word. And each of these “bodies” is intelligible in terms of its *conatus*, which, to him, means that for each “body” there is an idea, or “mind.”

The notion that the “minds” of such bodies and dynamic systems are the “ideas” of those phenomena is yet another way in which Spinoza’s thought fits awkwardly with our contemporary paradigm for which discussion of consciousness focuses on discrete entities or “selves.” As a result, Spinoza’s usage unavoidably raises questions about what it is that “thinks” these “ideas.” Spinoza’s answer—that these ideas exist in the Mind of God—is not very helpful when we recall that, for him, God is simply the totality of Nature, rather than the anthropomorphized “person” of conventional religion. Nor is the question made any less vexed by the realization that he considers each of these ideas to be “minds” in their own rights: “minds” which have “ideas” of their own.

In the face of such a question, it is helpful to refer back to the interpretations of Bennett,²⁵ Curley,²⁶ and Garrett,²⁷ cited above: first, that Spinoza’s conception of

²⁴At the level of the totality of nature, of course, the equivalent of *conatus* is not a striving to persist in being, but simply Being (*E1p20*), the idea of which is the attribute of Thought or Mind (*E2p1*).

²⁵Bennett 1984.

²⁶Curley 1969.

²⁷Garrett 2002.

Mind—the Mind of Nature as a whole—is a logical implication of the fact that human beings have minds, and, second, that what Spinoza means by Mind is something like the set of all possible true propositions about extended natural phenomena: the “sense” that nature “makes.” Thus, the “minds” of nonhuman “bodies”—be they stones, ecologies, or solar systems—contain “ideas” to the extent that the “sense” that these complex extended phenomena “make” necessarily includes the intelligibility of each of their parts.

2.2.3 *Human Psychology: Cognition and Emotion*

For our purposes, what is most important about Spinoza’s metaphysical conceptions is not really the question of, to paraphrase Thomas Nagle, “what it is like to be a rock,”²⁸ but rather, how these principles apply to the problems posed by mind/body relations on the human scale; and, in the human context, some of these apparently obscure issues become clearer. The statement that the human mind is the idea of the human body (*E2p13*) still requires explanation, but we are accustomed to the notion that humans have minds and that those minds contain ideas. According to Spinoza, both minds and bodies can be described as active, in the sense of *conatus* or striving to persevere in being. He tells us that the relationship of mind and body, for a given singular thing, is such that the particular body’s ability to act (to do things) is matched by the mind’s ability to know (*E3p9&d*). Human bodies are extremely complex and capable of doing a great many things in the service of preserving the complex relationships among its parts and between itself and other singular things (including other human beings). And, consciousness arises because the body’s ability to do many things in extended space is matched by the mind’s ability to know a great many things, including its own ideas, and also itself (*E2p13s*).

For Spinoza, however, true consciousness of self is not, as for Descartes, awareness of self as an independent thinker, but rather, the mind’s awareness of itself as a mode of the totality of nature, apprehended under the attribute of thought (*E5p31s*). And his understanding of objects and events other than the self is equally different from that of Descartes or any subsequent positivist epistemology. Seen in its true light, both self and external objects are, for Spinoza, inseparable from Substance and from one another, and any ideas we might have of them, separate from Substance, are inherently only partial and confused, or, in his term, inadequate (*E2p11c*). To him, the experience that Descartes appeals to with the *cogito* is, like all experience and all empirical knowledge, what he calls Knowledge of the First Kind, which, because of its perspectival nature, is inherently flawed. For him, the notion that there is “something it is like to be” anything, a notion that is so central to late twentieth-century debates on consciousness,²⁹ is of very little interest because

²⁸ Nagle 1974.

²⁹ See Chalmers 1996; Dennett 1988; Humphrey 2011; Nagle 1974.

our idea of “what it is like to be” a human being—never mind a bat (or a rock)—is necessarily inadequate.

What is important to Spinoza is not perspectival experience but reason. *Reason* is a term that he uses in two ways. In some cases, reason refers to what I have called “the sense that nature makes,” and in other contexts, he uses the term to refer to the step-wise reasoning of deductive processes like mathematics or logic. In the first sense, the one that interests him more, reason is the faculty whereby the human mind, as a Mode of Substance, can grasp top-down causality and can express the eternal order of ideas as they exist in Mind (E2p9c,10c). These ideas, he teaches, can be adequately apprehended either by direct intuition of the essences of singular things or by reasoning (in the second sense) about properties that are common to all singular things. In his cognitive theory, reasoning and intuition are, respectively, the Second and the Third Forms of Knowledge (E2p40s2). Though Spinoza values the latter more highly because it is more direct, both provide equally certain answers and result in adequate ideas, which, by definition (E2d4), are necessarily true conceptions of a thing as it actually is in Nature. Knowledge of the First Kind can never be adequate because an adequate idea must account for its *ideatum* without reference to anything other than the phenomenon in question, and anything we experience is necessarily a result of networks of bottom-up causality for which we cannot ever fully account. We can know by reason—which is to say by intuition and deduction from either universal laws (E2p7) or the eternal essence of Nature (E1d3)—that a given simple body’s movement or rest is caused by that very body’s *conatus*. But, to be adequate, an idea of the proximate causes of the speed and direction of that body’s movement would have to include knowledge of an infinite regress of more distal causes, which lie outside our experience. It is only by intuition that we come to an awareness of anything, including ourselves, as a Mode of Substance, the insight with which Spinoza opposes Descartes’s experiential *cogito* with its dualist implications.

The fact that most of the ideas we have of ourselves and our environment are based on experience is the key element in Spinoza’s theory of affects. He defines affects, or emotions, as “affections of the Body by which the Body’s power of acting is increased or diminished, aided or restrained, and at the same time, the ideas of these affections” (E3d3). This definition reflects the doctrine that a particular human mind is the idea of a particular body (E2p11,13), which has encounters with other bodies in its environment. Awareness of external things is limited to the way they affect our bodies, and, furthermore, he argues that the body itself is known only through the effects of such contacts (E2p16). For complex bodies that require external resources, such contacts inevitably have the effect of increasing or decreasing the person’s power to continue existing: its *conatus*. His detailed account of the emotions (he lists and defines 47 of them) is built around three primary affects: Desire or Appetite, which is the psychological manifestation of the *conatus*, or striving to exist; Joy, which is the experience of anything that increases the person’s power of acting to preserve itself; and Sadness, which is the experience of anything that decreases his or her capacity to act (E3p9s, 11s). The other 44 emotions are the combination of one of these primary affects with other ideas—e.g., hope is joy arising from the idea of something in the future (E3p18s2).

All emotions entail some element of desire—which as a form of *conatus* is active—and the overwhelming majority are “passions,” that is, passive responses to changes in our power to preserve the self resulting from causes external to the person; and therefore, such emotions are understood only inadequately. The only exception is the pleasure we take in reasoning. This pleasure is an exception because reason is the essential activity of the mind; so the pleasure we take in it does not result from any inadequately understood external cause. The person is thus the adequate (complete) cause of this affect (*E5p3*). Most of the time, people act and react on the basis of experience, which is to say on inadequate ideas, and when they do so, they are not really the cause of their own actions, but are passively being acted upon: They are in the grip of a passion. Only when acting from reason can a person be considered a true agent. It is important to note, however, that in Spinoza’s theory, because the *conatus* of a human being is ultimately not as powerful as that of the external things that affect it, human reason itself is not sufficient to counteract emotions. It is not reason, but the love of reason or the joy taken in it, that motivates what he calls virtuous behavior (*E5p7*). All human behavior is in some way driven by the desire to preserve the self, but, because the essential activity of the mind is reasoning (*E3p1,3*), the self to be preserved is a reasoning self, which is weakened by the passive affects (passions). The only actions that can successfully contribute to the preservation of the self are those guided by reason in its larger sense, the sense that includes the intuition that it is a mode of Substance (*E1d5*) and the realization that it is subject to the laws of Nature (*E4apnd32*).

2.3 The Reception of Spinoza’s Ideas

As noted above, Spinoza’s ideas were not well received by his own or the immediately succeeding generations. Because of his rejection of a transcendent creator deity, his contemporaries condemned him as an atheist; and his commitment to the life of reason led him to radically republican political ideas³⁰ that were considered anathema by nearly every government in Europe.³¹ Only in the Dutch Republic under Johan de Witt (1653–1672) were such ideas tolerated; but by the time Spinoza died in 1677, 5 years after de Witt’s assassination, conservative Orangist rule in the Netherlands had been restored, and under it, clerical and civil authorities made a concerted effort to prevent publication of his posthumous works. Their attempt failed, but only because of an elaborately planned ruse carried out by Spinoza’s literary heirs.³² Spinoza’s works have never gone out of publication since; but official animosity was sufficient to marginalize his philosophy so successfully that for nearly a century after his death it was not safe to discuss his works in print without

³⁰ de Spinoza 1677/2002.

³¹ See Israel 2001; Jacob 2006.

³² See Gullan-Whur 2000; Nadler 2001.

including an explicit condemnation of them.³³ In the latter part of the eighteenth century, his public reputation would be rehabilitated by the German Romantics, but his new champions were so far removed from Spinoza's scholastic intellectual context that they mistook him for a pantheist,³⁴ attempting to enlist his work in their reaction against the rationalism of the classical Enlightenment—a rationalism of which he was a principle proponent.

2.3.1 *Enlightenment Thought and Research*

The result of this effort to marginalize his work was that Spinoza's ideas had very little influence on early research and theorizing about the mind and brain. Early anatomists, in particular, ignored his approach. Willis³⁵ and (of course) Descartes³⁶ attempted to explain neurophysiology reductively. They believed the nervous system was composed of hollow tubes through which minute particles (animal spirits) transmitted the impact of external moving particles on sense organs to the brain, which, in turn, directed streams of such particles to activate muscle tissue and understood muscle contraction as resulting from the tissue being inflated by an influx of such particles.

This atomistic, essentially Cartesian, animal spirits model of nerve function persisted well into the eighteenth century, during which it served as the basic model for neuroanatomists like François Pourfour du Petit (1664–1741) and Robert Whytt (1714–1766). In the middle and later parts of the century, the animal spirits accounts would be challenged by anatomists like David Hartley (1705–1757) and Charles Bonnet (1720–1793), who argued that nerves transmit information about the external world by means of vibrations,³⁷ and by Albrecht von Haller (1708–1777), who opposed the idea that muscles contracted when inflated by animal spirits with the notion that all animal tissue was somehow irritable.³⁸ But, such alternatives to the animal spirits model, while reflecting more accurate anatomical observation, were no less reductive than the Cartesian model. Bonnet's notion of mind/body relations does seem to have borrowed from Leibniz,³⁹ who had attempted to reframe Spinoza's holism in a theistic and politically conservative framework, but Spinozan influence seems otherwise missing among these early anatomists.

There are, of course, methodological reasons why natural philosophers engaged in anatomical research would gravitate toward a reductive approach. Their work, unlike Spinoza's, was empirically based, and thus, they were inclined to believe that

³³ Israel 2001.

³⁴ See DeCuzzani 1991; Goetschel 2004; Jacobi et al. 1916/2010.

³⁵ Willis 1683/1971.

³⁶ Descartes 1996b.

³⁷ See Bonnet 1760/2011; Hartley 1749/1834; Whitaker and Turgeon 2007.

³⁸ Frixione 2007; von Haller 1735/1936.

³⁹ Stewart 2006.

the structures they were observing at a micro level were the causes of the more familiar gross behavioral phenomena they sought to explain. Such methodological motives, however, cannot explain the formulations of thinkers like John Locke (1632–1704) and David Hume (1711–1776), whose interest was in the study of human cognition by direct observation alone.

Locke⁴⁰ was less thoroughgoing in this endeavor. In spite of expressed intentions to avoid questions about how the mind receives information from the external world (*EHU* Intro.2.), his thinking was clearly influenced by the atomistic animal spirits doctrine that ideas are derived from motion of particles in the external world, producing sensation by causing motion of particles carried to the brain through hollow nerves (*EHU* 2.8.11–13). His theory of ideas—according to which our common understanding of the world is a mental construction created by combining these fundamental and irreducible simple ideas (*EHU* 2.2.1–2)—is, thus, as reductive and atomistic as Descartes’s.

Hume⁴¹ was more consistent in his effort to conduct his analysis of the way ideas interact with one another without making any hypotheses about the relation between ideas and their possible causes in the external world (*T*. 1.3.5.2). His reflections led him to an account of mental phenomena in which the association of ideas is grounded only in feeling and habit and cannot be justified by reason (*T*. 1.4.1.12). This contention that thought could not be separated from sentiment or feeling, while not explicitly Spinozan, bears some similarity to Spinoza’s affects doctrine (*E4p14*). Also, though he accepted the atomistic “theory of ideas,”⁴² his discovery of a logically unbridgeable gap between reason and customary association of ideas showed the limits of the Lockean approach,⁴³ and confirms Spinoza’s designation of empirical knowledge as “inadequate” (*E2p11c*). Furthermore, he is quite Spinozan in his solution to the conflict between reason and habitual thought: Seeing both as products of nature. These Spinozan elements in his thought are probably not accidental; in his youth, Hume was friendly with a group of British Spinozaists, and a number of scholars have argued that he retained more sympathy for Spinoza than he could safely express.⁴⁴

The same is not true of Hume’s contemporary, David Hartley, who proposed a somewhat different version of associationist psychology. He, like Bonnet, argued that ideas are formed when vibrations from the external world are transmitted to the brain through the sense organs and along the nerves.⁴⁵ This model appealed to Hartley because of its coherence with ideas about physics proposed by Isaac Newton in his *Optiks*,⁴⁶ and because by the middle of the eighteenth century, it was known that nerves are not the hollow tubules described in the earlier animal spirits theories.

⁴⁰ Locke 1690/1959, hereafter “*EHU*”.

⁴¹ Hume 1639–1640/2007, hereafter “*T*”.

⁴² Stroud 1977/2004.

⁴³ Meehan 2010.

⁴⁴ See Giancotti 1999; Klever 1993; Popkin 1979; Russell 1993.

⁴⁵ Hartley 1749/1834.

⁴⁶ Newton 1730/1952.

The Newtonian element was the idea that the nervous vibrations were supposed to be the same kind of phenomenon as that which allowed gravitational forces to operate at a distance. In this way, Hartley's theory implies a harmonically vibrating universe: An idea which has a certain totalizing thrust. But Hartley, who was a religious man, was unlikely to have been influenced by, or to have even read, Spinoza.

Comparing Hartley's theory of mental associations with that of Hume, it is historically important to note that the former's efforts to tie his account of mental activity to an overly simplified model of physics makes his psychological associationism considerably less flexible than Hume's.⁴⁷ This is of interest because it was Hartley's version of associationism that would later be adopted by Jeremy Bentham (1748–1832), whose utilitarian philosophy was a major influence on twentieth-century learning theory.⁴⁸ The reception of Hume's model, on the other hand, was limited by the focus of his contemporaries—particularly Thomas Reid (1710–1796) and Immanuel Kant (1724–1804)—on what they erroneously took to be his skepticism.⁴⁹

2.3.2 Nineteenth-Century Research

Given the consummately rationalist nature of Spinoza's work, it is ironic that his public rehabilitation, after a century of censorship by the Moderate Enlightenment,⁵⁰ should fall to the antirationalist German Romantics; and this irony is compounded by the fact, noted above, that his new champions, lacking a familiarity with the scholastic roots of Spinoza's *Deus sive Natura* formulation, mistook his holism for pantheism. In spite of such errors, however, the coming of Romanticism marks an important shift in the way European intellectuals approached the study of nature in general and the mind and brain sciences in particular: Before the Romantic reaction, the dominant model had been that of "natural philosophy" with figures from Descartes to Newton and Hartley combining speculative theorizing with experimental research. Afterwards, there was a growing tendency for speculation and experimentation to drift apart so that, by the end of the nineteenth century, science and philosophy would be seen as two separate fields of endeavor.

The career of the Romantic Idealist, Friedrich Schelling (1775–1854), predated this transition. Schelling wanted his *Naturphilosophie* to influence natural science and he devoted considerable effort to experimental work, which he attempted to synthesize into a holistic paradigm, explicitly inspired by Spinoza, in which nature was seen as a kind of organism.⁵¹ Schelling's influence, however, was limited. The

⁴⁷ Meehan 2011.

⁴⁸ Steintrager and Elkins 1977.

⁴⁹ Piper 1978–1979; Wood 1990.

⁵⁰ Israel 2001.

⁵¹ Richards 2002.

pioneers of what we might call modern neuroscience rejected the vitalist and epigenetic hypotheses to which Schelling's work gave rise. Though certainly aware of Schelling—and often recognizing Spinoza as having foreshadowed some of their findings⁵²—they assumed a Cartesian-like conception of bottom-up causality according to which higher-level structures are determined by simpler, more fundamental ones.

This extremely fruitful, early neurophysiological work was, perhaps, best exemplified by the theories and research of Johannes Müller (1808–1858) and his students, who focused detailed investigation of discrete neurological phenomena at the level of cells and reflexes. Their findings include (a) Müller's own formulation of the law of specific energies, (b) the isolation of the cells composing the glia surrounding peripheral nerves by Theodor Schwann (1810–1882), (c) Emil du Bois-Reymond's (1818–1896) discovery of nerve action potential, and (d) Herman von Helmholtz's (1821–1894) measurement of the speed at which electrical signals travel along nerve fibers.⁵³ These were discoveries that advanced our understanding of nerve function far beyond the animal spirits and vibratory notions of the previous century and provided a basis for much later work, including the psychological research of Wilhelm Wundt (1832–1920). Helmholtz's work in particular was essential for the modernization of the originally Cartesian conception of the discrete reflex,⁵⁴ which, in the late nineteenth and early twentieth centuries, would emerge as the primary building block for Ivan Pavlov's (1849–1936) ideas about cortical associationism, B. F. Skinner's (1904–1990) behaviorism, and even the earliest formulations of Sigmund Freud's (1856–1939) *Project for a Scientific Psychology*.⁵⁵

Though these theories were based on the bottom-up causality so central to the Cartesian perspective, some of the important developments of the period did point in the direction of more encompassing formulations, much of which consolidated the earlier micro-level research. This would include: Santiago Ramón y Cajal's (1852–1934) neuron doctrine, also such brain localization research as the cortical mapping work of Korbinian Brodmann (1868–1918) and the discovery of specific language regions by Pierre Broca (1824–1880) and Karl Wernicke (1848–1905). Yet another example is Charles Sherrington's (1857–1952) investigation of the coordination of spinal reflexes into fundamental units of action.⁵⁶ The most important integrative work of the period, however, was that of John Hughlings Jackson (1835–1911), who, influenced at least indirectly by Darwin, developed an evolutionary hierarchal model of the brain.⁵⁷ Hughlings Jackson's work, in turn, has influenced a variety of later holistically inclined researchers,⁵⁸ including Nikolai Bernstein (1896–1966) in Russia and Paul MacLean (1913–2007) in the United States.

⁵² Damasio 2003.

⁵³ Finger 2001.

⁵⁴ Platt and Glimcher 1999.

⁵⁵ Freud 1950/1966.

⁵⁶ Finger 2001.

⁵⁷ See Foerster 1936; Smith 1982.

⁵⁸ LeDoux 1998.

2.3.3 *Spinozan Concepts in Recent Mind/Brain Research*

One of the contradictions in twentieth-century neuroscience is that, despite a general acceptance of Cartesian reductive methods, researchers have evidenced a marked distaste for Descartes's mind/body dualism largely because it implies that human thought and experience lie outside the natural world and beyond the reaches of scientific methods.⁵⁹ Some, like David Chalmers⁶⁰ and Thomas Nagle,⁶¹ have argued that, because it is perspectival, human experience is not analyzable in objectively scientific terms: hence, what is referred to in the literature as "the hard problem." However, the argument of Patricia Churchland's *Neurophilosophy*,⁶² that human thought could ultimately be explained in neurological terms, was more widely accepted.⁶³ Yet, as our understanding of neuroscience has improved, this Cartesian method seems to be reaching the limits of its usefulness, and some researchers, particularly those studying movement and the emotions, have begun to consider Spinoza-like alternatives to a forced choice between dualist and reductive-materialist solutions to "the hard problem."

By and large, contemporary researchers who pursue these Spinoza-like conceptions have arrived at them independently and make little or no direct reference to Spinoza. One exception to this generalization is Antonio Damasio, whose *Looking for Spinoza*⁶⁴ is an explicit effort to relate Spinoza's philosophy to contemporary neuroscience. At the heart of Damasio's argument in this book are two Spinozan ideas: the notion that the mind is the idea of the body (*E2p13*), and the assertion, which pervades the Third Part of the *Ethics*, that this mind/body unity implies the centrality of emotion in cognitive processes. For Damasio, the mind is a collection or stream of the mental images of bodily events. These events are responses to what he calls "emotionally competent stimuli,"⁶⁵ and in an earlier work,⁶⁶ he presented research evidence that damage to emotion processing structures in the brain impairs decision-making processes in ways that compromise an individual's ability to survive. Absent the neurological images of bodily responses to environmental stimuli, an organism has an impaired sense of self and cannot, in Spinoza's terms, "endeavor to persist in being" (*E3p6*).

Damasio's model also parallels Spinoza's idea that the *conatus* of singular things is manifest, not only in the momentum exhibited by simple objects, but in the dynamic internal relations and homeostasis of complex ones (*E2a2'd*). For Damasio, the emotions and feelings of complex organisms are the product of a nested

⁵⁹ See Damasio 1994; Humphrey 2011.

⁶⁰ Chalmers 1996.

⁶¹ Nagle 1974.

⁶² Churchland 1982.

⁶³ E.g., Dennett 1991; Freeman 2000.

⁶⁴ Damasio 2003.

⁶⁵ *Ibid.*, p. 53.

⁶⁶ Damasio 1994.

hierarchy of reactions in which, for example, metabolic processes are elements of immune reflexes, and both are mobilized in pain and pleasure behaviors, drives, and complex emotions like love and sympathy.

Spinozan as Damasio's work is, he still preserves a somewhat bottom-up approach that results in a more passive conception of the mind than Spinoza proposed. Damasio's main focus is on presenting a theory of emotions, a modernized version of the James-Lange theory, and while he does an excellent job of showing how his findings were foreshadowed by many of Spinoza's ideas about mind/body relations, he does not seem to capture the full antireductionist import of Spinozan metaphysics. There is a way in which Damasio's nested hierarchy is constructed along the lines of bottom-up causality with higher functions seen as complex reflexes. Furthermore, while he conveys Spinoza's understanding of the ways our emotions are driven by environmental events and organized around the impulse to survive, he misses the insights about the *human* mind as rational and motivated to preserve itself as a rational entity. In Damasio's model, the mind receives emotionally significant information and reacts to it, but, while Damasio is certainly aware of the active role of attention in emotional/cognitive processes, he does not convey Spinoza's vision of the mind as striving to preserve and foster its own rational capacities motivated by an intellectual love of God—which is to say, Nature (E5p32c).

More closely aligned with Spinoza's notion of an intellectual emotion is research reported by Jaak Panksepp in his *Affective Neuroscience: The Foundations of Human and Animal Emotions*.⁶⁷ Panksepp, unlike Damasio, makes no explicit reference to Spinoza but his work—building on Olds and Milner's⁶⁸ neuroanatomical research into self-stimulation and on Edward Chase Tolman's⁶⁹ studies of animal behavior and motivation—suggests an understanding of human and animal minds as less dependent on external stimuli and more active than that depicted by Damasio. Specifically, Panksepp focuses on a neural system, not described by Damasio, in the lateral hypothalamic corridor, which supports an emotional urge to explore the environment for its own sake rather than as a means of obtaining satisfaction for drives related to immediate survival or reproduction. The behaviors, as well as the hormonal and sympathetic nervous activity evidenced when this system is active, are quite dissimilar to those that accompany the animal's consumption of a conventional "reward." In Panksepp's model, the self-activating "seeking system" provides a neurological and affective basis for the animal's sense of self, and in humans, a sense of self-conscious ego. This, of course, is precisely the kind of neuropsychological structure we would expect to find in a being that Spinoza describes as needing to understand the world of which it is a part (E5p7).

In addition to Damasio's work on the interaction of emotion, mind, and body—and Panksepp's understanding of a primary-seeking drive: curiosity—neuroscientists are also discovering phenomena and processes for which they can account only

⁶⁷ Panksepp 1998.

⁶⁸ Olds and Milner (1954).

⁶⁹ Tolman 1922/1958.

in terms of a Spinoza-like, if not explicitly Spinozaist, holism with its recognition of top-down causality. The most profound impulse towards biological holism was, of course, the development of evolutionary theory, completed by Charles Darwin (1809–1882) in his *Origin of Species*.⁷⁰ The evolutionary approach was applied specifically to neuroscience by John Hughlings Jackson, following the alternate model of evolution proposed by Herbert Spencer (1820–1903).⁷¹ The key premise of any post-Darwinian evolutionary theory is the interplay of variation and selection: with specific, isolated (and thus atomistic) mutations exercising a bottom-up causality while nature as a whole has a top-down causal effect through the process of selection.⁷²

Hughlings Jackson's importance to the current narrative, however, is not limited to his evolutionary theorizing. His interest in epilepsy led him to the study of motor activity, and through this aspect of his work, as noted above, he influenced Nikolai Bernstein's studies of the motor system. These studies moved beyond the Cartesian assumptions of Sherrington's analysis of the way reflexes are integrated into fundamental units of action in the spinal cord,⁷³ to the study of how the whole organism exercised top-down control, limiting and directing the vast range of possible movement to those specific actions needed for its immediate purpose (Bernstein 1998). Bernstein also elaborates a very Spinozan notion of the interrelationships of mind, body, and environment in his observation that the body, in particular the hand, represents objects in the environment by virtue of the ways in which it adjusts itself to conform to those objects. In his account, these bodily "representations" are the physical correlates of a mental activity, such that dexterity is a kind of intelligence.

This notion, of course, is a direct contradiction of the Cartesian mind/body dualism that gives rise to "the hard problem." It also suggests that what we think of as the human mind might not be wholly located in the person: It might, to some degree, be distributed or situated in the environment. This distributed intelligence model has been elaborated by Andy Clark⁷⁴ and others.⁷⁵ In such a model, the mind is situated in both the individual and the environment, which, though stated without the language of seventeenth-century scholastic rationalism, is suggestive of Spinoza's teaching that the human mind, far from being a discrete entity, is a mode of the totality of which it is a part (*E2p5&11c*).

This holistic notion of top-down causality, combined with a Spinoza-like emphasis on the mind/body (organism) as actively striving to persevere in being, is also implicit in the late twentieth-century focus on the relation between motivation and action. One researcher, Charles Gallistel,⁷⁶ defines motivation in terms of the potentiation/depotentiation of motor subroutines and traces connections between

⁷⁰ Darwin 1859/2003.

⁷¹ Smith 1982.

⁷² See Monod 1971; Polanyi 1967.

⁷³ Sherrington 1961.

⁷⁴ Clark 1997.

⁷⁵ For a comprehensive review, see Chandrasekharan and Osbeck 2010.

⁷⁶ Gallistel 1980, 1993.

high-level control systems and lower-level neurobehavior: work that can be seen as an extension and verification of Bernstein's. Another contemporary neuroscientist, Marc Jeannerod,⁷⁷ presents evidence supporting a simulation theory according to which the mind creates images of external objects in terms of the neural patterns necessary to interact with those objects: what he calls action images. Ralph Ellis and Naktia Newton⁷⁸ have further argued that the mind's repertoire of action images includes not only the neural traces of actualized interactions with the external world, but also the traces of motor commands that were inhibited before they could be activated. In any coordinated action images, the order of the neural traces necessarily matches the order of the actualized or imagined physical motions; this notion comes very close to Spinoza's doctrine that the order of ideas in the mind matches the order of physical things (*E2p7*). Such action images are, in Cartesian fashion, grounded in the cellular activity of the neurons,⁷⁹ but are also shaped in top-down fashion by the organism's larger purposes and the structure of the environment in which that organism can imagine acting out its purposes.

2.4 Conclusion

As my title suggests, the narrative of Spinozan concepts in the mind and brain sciences is, in many ways, a story of the return of the repressed: ideas censored and ignored in most of early-modern natural philosophy and in the early stages of modern neuroscience being rediscovered and reintroduced, either explicitly or implicitly, after the political and religious conditions that gave rise to the censorship had passed and when the problems inherent in the Cartesian paradigm began to outweigh its usefulness. These ideas include the notion of top-down causality: a conception of mind as the representation of the body (c.f., *E2p13*) based on its interaction with the environment (c.f., *E2p16*) and an understanding of human nature, in both its physical and mental abilities, as an integral part and product of nature as a whole (c.f., *E2p9c,10c*).

The suitability of Spinoza-like ideas for overcoming the limitations of Cartesian reductionism and mind/body dualism is, of course, to be expected, given that both Spinoza's metaphysics and his biology were developed as explicit refutations of Descartes. But the reemergence of these approaches is not exactly a "rediscovery": intimations of holism can be found in Hume, and in a somewhat distorted form, Spinoza's ideas were asserted by the German Romantics and thus kept alive as at least a possible approach for nineteenth-century biology and neurophysiology. The key to the resurgence of Spinozan ideas in modern mind and brain sciences, however, was Darwin's theory of evolution, which, as a secular explanation of nature as a whole that treats organisms as the products of a self-caused—or at least

⁷⁷ Jeannerod 1997.

⁷⁸ Ellis and Newton (2010).

⁷⁹ Lethin 2002.

self-organizing—nature (cf., *E1d1*), refutes the Cartesian *cogito*. When nature is understood as evolutionary process, Descartes's conception of the self as a discrete entity becomes incoherent, as does the notion that the mind and body are anything other than products of the same process that has shaped the one along with the other (cf., *E2p10*). And, when the behavior of organisms is seen to be motivated by survival needs (cf., *E3p6*), sharp distinctions between thought and emotion become equally meaningless (cf., *E3Preface*).

The totalizing effect of evolutionary theory is, thus, comparable to Spinoza's holism, allowing a change whereby the cell and reflex-level neuroscience could be augmented by the whole brain approaches of Hughlings Jackson and Bernstein, among others. So, too, Darwin's emphasis on survival and adaptation, which parallels Spinoza's *conatus*, are the key elements in both Damasio's and Panksepp's understanding of motivation and emotion. These elements can also be found in the work of Gallistel, Jeannerod, and others in which mental imagery and cognition are understood in terms of intentional interaction with the environment.

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