

Aquinas on the Immateriality of Intellect

A Non-materialist Reply to Materialist Objections

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We can talk about persons having bodily states and having mental states. Bodily states include being at rest or in motion, having a magnitude, mass, and temperature, the positions of electrons, motions of molecules, firing patterns of neural networks, and so on. Mental states include deliberations, judgments, intentions, choices, perceptions, recollections, feelings, reports of mental states, and so on. We can say that to those who have mental states, their mental states are describable either in entirely physical terms, entirely nonphysical terms, or a combination of physical and nonphysical terms. The first is the *materialist position* dominant in neuroscience,¹ psychology,² and the social sciences generally. Although arguments for the materialist position can take several forms, all agree that the ultimate nature of the mind is

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¹Jeffery Schwartz writes that materialism “has neuroscience in a chokehold and has had it there since the nineteenth century.” Jeffrey M. Schwartz and Sharon Begley, *The Mind and the Brain: Neuroplasticity and the Power of Mental Force* (New York: Regan Books, 2002), 25. One example from neuroscientific literature is Yuri I. Arshavsky, “‘Scientific Roots’ of Dualism in Neuroscience,” *Progress in Neurobiology* 79.4 (July 2006): 190–204.

²Psychologist Daniel Siegel asserts that “the mind is created within the interaction of internal neurophysiological processes and interpersonal experiences.” Daniel J. Siegel, *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are* (New York: Guilford Press, 1999), 2.

physical. The second is the *immaterialist position* of substance dualism made famous by Descartes. He argues that since it is possible to conceive of oneself as having no body, but not coherently to conceive of oneself as having no mind (i.e., not being a thing that thinks), it must be the case that mind and body are two completely different substances.³ The third can be called the *non-materialist position* and is represented by the hylomorphic theory of Aristotle and Aquinas and contemporary defenders of hylomorphism such as John Haldane and David S. Oderberg.⁴

This essay is concerned with explicating a workable version of the non-materialist position. I do not directly engage at any length Cartesian dualism since defenders today are rare.⁵ Nevertheless, the Cartesian resolution to the mind-body problem is relevant to my purposes, albeit indirectly.⁶ The Cartesian account familiarly identifies the human essence entirely with mind (or soul), leaving the body as a sort of material add-on. In so doing it posits a radically dichotomized pair of anthropological principles in the make-up of human beings. This philosophical account has given rise to two centuries of philosophers eager to refute what they consider

³See René Descartes, “Meditations on First Philosophy,” meditation II, in *Discourse on the Method and Meditations on First Philosophy*, ed. David Weissman (New Haven, CT: Yale University Press, 1996), 63–66, and “Discourse on the Method,” part IV, 21–22.

⁴John Haldane, “A Return to Form in the Philosophy of Mind,” in *Form and Matter: Themes in Contemporary Metaphysics*, ed. David S. Oderberg (Oxford: Blackwell, 1999), 40–64; Haldane, “The Metaphysics of Intellect(ion),” *Proceedings of the American Catholic Philosophical Association* 80 (2006): 39–55; David S. Oderberg, “Hylemorphic Dualism,” in *Personal Identity*, eds. Ellen Frankel Paul, Fred D. Miller Jr., and Jeffrey Paul (Cambridge, U.K.: Cambridge University Press, 2005), 70–99.

⁵Critics of the Cartesian thesis are numerous in the past fifty years. See, for example, Peter Strawson, “Persons,” in *Body and Mind: Readings in Philosophy*, ed. G. N. A. Vesey (London: George Allen & Unwin, 1964), 403–424. See also Gabriel Marcel, “Concrete Approaches to Investigating the Ontological Mystery,” in *Gabriel Marcel’s Perspectives on the Broken World*, trans. Katharine Rose Hanley (Milwaukee: Marquette University Press, 1998), 172–196, esp. 178; “An Essay in Autobiography,” *The Philosophy of Existentialism*, trans. Manya Harari (Secaucus, NJ: Citadel Press, 1956), 104–128, esp. 127–128; *The Mystery of Being*, vol. 1, *Reflections and Mystery* (Chicago: Henry Regnery, 1960), 127–153. These critics include scholars of the so-called “new feminism”; see Michele M. Schumacher, “The Nature of Nature in Feminism, Old and New: From Dualism to Complementary Unity,” in *Women In Christ: Toward a New Feminism*, ed. Michele M. Schumacher (Grand Rapids, MI: Eerdmans, 2004), 17–51, esp. 17–21.

⁶Descartes concludes that the human being is essentially a *res cogitans*; it follows, he reasons, that to think bodies are not necessary, the human essence therefore must *entirely* be mind: “To speak accurately I am not more than a thing which thinks, that is to say a mind or a soul, or an understanding, or a reason, which are terms whose significance was formerly unknown to me. I am, however, a real thing and really exist; but what thing? I have answered: a thing which thinks . . . not a collection of members which we call the human body.” Descartes, “Meditations on First Philosophy,” meditation II, in *Discourse on the Method*, 65. I am aware there are statements in Descartes’ lesser known writings that indicate a less radical dualistic split than presented here. Nevertheless, this rendering is widely accepted, and so I think I am justified in following Strawson in referring to it as Cartesian.

(understandably) to be an unworkably obscure metaphysical account of the human psychosomatic constitution. Unfortunately, when *any* duality of ontological principle is defended in philosophy, it is invariably taken to refer to substance dualism in a Cartesian guise, and is hastily set aside as implausible and often subjected to the “whipping post” of scholarly ridicule.⁷ The problems associated with accounting for how a wholly substantially distinct immaterial mind could interact with an alien material body subject to the causal laws of the physical universe, and of adequately explaining how such interaction can account for all the phenomena and acts of human cognition, have persuaded the majority of philosophers not to defend any immateriality in the intellect and the rest to stay quiet. The materialist premise, whether in its reductivist or non-reductivist forms, is effectively a philosophical *a priori*.⁸

My purpose in this essay is to defend a non-Cartesian account of the immateriality of the intellect in which the immaterial principle is not metaphysically alien from the material principle but rather united to it in the closest possible natural union, namely, that of form to matter.⁹ The account is Aquinas’s and is part of his wider defense of Aristotelian psychology. The central concept in Aristotle’s psychology is soul (psyche), of which intellect is the defining operation; hence in Aristotle and Aquinas, the human soul is called intellectual (or rational).¹⁰ The central term defining soul is *form*. The soul, Aristotle says, is the substantial form of the living body, the principle of actuation of a body capable of possessing life.¹¹ As its form, the soul is an “intrinsic constituent” of human beings, intrinsic because it belongs to their essential constitution, constituent because it is “a real part or element . . . , though not on the same level as the substance’s natural parts, for example, the branch of a tree or the leg of a dog.”¹² Rather, the soul is a “radical or fundamental part,” the principle of identity, that in virtue of which humans are what they are. Soul is not a complete substance wholly other from the body as in the Cartesian account. Of its own it does not constitute the person; as Aquinas states, “anima mea non est ego” (“I am not my soul”).¹³ Rather the

⁷“Cartesian dualism has clear and unassailable pride of place as the whipping post on which dualists are ritualistically flailed.” Oderberg, “Hylemorphic Dualism,” 71.

⁸Ibid.

⁹This is of obvious importance for Christian philosophy since the faith it endeavors to explain posits an immaterial immortal soul immediately created by God. See Pius XII, “Encyclical Letter *Humani Generis*” (1950), in *The Christian Faith in the Doctrinal Documents of the Catholic Church*, 6th ed., eds. J. Neuner and J. Dupuis (St. Paul, MN: Alba House, 1996), n. 419; “The Profession of Faith of Paul VI” (1950), in *The Christian Faith*, n. 39.) But the argument is not from the authority of faith. It is a philosophical argument that stands or falls on the soundness of its premises.

¹⁰Thomas Aquinas, *Summa theologiae*, I, Q 78.1, trans. Fathers of the English Dominican Province (Westminster, MD: Christian Classics, 1981).

¹¹Aristotle, *De anima*, bk. II, ch. 1, 412a20–21.

¹²Oderberg, “Hylemorphic Dualism,” 76.

¹³“Anima sit pars corporis hominis, non est totus homo, et anima mea non est ego.” Aquinas, *Super primam epistolam ad Corinthios lectura*, xv, lect. 2, reply v. 19; see *Summa theologiae*, I, Q 75.4, *Quodlibetum* VII, Q 5.1, reply 3; and *Summa theologiae* I, Q 75.4.

two are naturally inseparable, each incomplete without the other¹⁴—“I am body-soul” (an *ensouled body* or an *embodied soul*). Together body and soul constitute a single substantial unity, the body accounting for the material particularity of human beings and the soul for *all their living operations*. Aquinas’s account is “non-materialist,” because among these living operations are ones which are necessarily carried out *through* organs and organ systems of the body (e.g., nutrition, growth, reproduction, sensation, perception, memory, imagination) and operations that are carried out independent of the body (e.g., concept formation, abstract reasoning).¹⁵ The latter I will argue cannot be accounted for by analyzing and explaining physical operations.

Before I explicate Aquinas’s defense of the intellect’s immateriality, I will review a few influential positions in the philosophy of mind to which Aquinas’s account offers a suitable reply. Because the dominant conclusion today on the nature of mind is the materialist position, I begin by reviewing the most common materialist arguments. Each deserves a reply, and indeed the literature is full of arguments for and against each. But in the interests of this essay, I merely set the positions forth by way of juxtaposition to the position I will defend.

Mind Is Matter

Materialist accounts of the nature of mind can be divided into reductionist accounts and non-reductionist accounts. Non-reductionist accounts hold that although mental events are identical to physical events (i.e., the basic materialist premise), the mental is not reducible to the material. Reductionist accounts, such as *type identity theory* defended by J. J. C. Smart and U. T. Place,¹⁶ argue that mental states are identical to brain states; so a mental state like the experience of pain can be equated completely with a neurological state such as the firing of C fibers.

Epiphenomenalism, originally defended in the late nineteenth century by Thomas Huxley,¹⁷ and in different forms more recently by scholars like Frank

¹⁴This is not to assert simply that they are inseparable, but rather *naturally* inseparable. Where Aristotle was tentative on the question of their separability (see *De anima*, book II, ch. 1, 413a4–9), Aquinas, enlightened by Christian revelation, was more certain. Proceeding from the revealed premises that all will “stand before the judgment seat of God” after bodily death (Rom. 14:10, Heb. 9:27, 2 Cor. 5:10) and that at the end of the age there will be a bodily resurrection of the dead (1 Cor. 15:12–15), Aquinas asserted with confidence both the separability of soul from body *and* the essential (hylomorphic) relationship between body and soul in the human person.

¹⁵See Aristotle’s statement on such operations in *Generation of Animals*, bk. II, ch. 3, 736b27–28.

¹⁶See their seminal essays in J. J. C. Smart, “Sensations and Brain Processes,” *Philosophical Review* 68.2 (April 1959): 141–156, and U. T. Place, “Is Consciousness a Brain Process?” *British Journal of Psychology* 47 (1956): 44–50.

¹⁷See Thomas Huxley’s seminal essay, “On the Hypothesis that Animals Are Automata, and Its History,” *Fortnightly Review*, n.s. 16 (1874), 555–580, reprinted in *Method and Results: Essays by Thomas H. Huxley* (New York: Appleton, 1898). See William James’s early criticism of epiphenomenalism in “Are We Automata?” *Mind* 4 (1879): 1–22.

Jackson¹⁸ and the influential analytic philosopher Donald Davidson,¹⁹ is a type of non-reductive materialism. It holds that mental phenomena proceed from cortical activity as distinct kinds of phenomena and cannot be reduced to neuronal events. This sounds like a promising dialogue partner with non-materialist accounts. But epiphenomenalism begins with the materialist premise that the physical world is causally closed and so all phenomena proceed from physical causes. The brain therefore is the cause of all mental events, which themselves cause nothing. Consciousness and all forms of phenomenal experience are merely by-products (*epiphenomena*) of neuronal activity. They are real and not reducible to neural activity, but have no causal status on the material universe, no influence on the physical world.²⁰

The more influential non-reductivist theory today is *functionalism*. It holds that mental states are best understood as definable in terms of the functional role they perform.²¹ In short, mental states are functional states. To understand what is being proposed here we might appeal to the distinction between microanalysis, which identifies the physical characteristics of a thing, and functional analysis, which identifies something by reference to its function.²² For example, we can analyze an axe in terms of its physical properties or in terms of its function. Each type of analysis establishes a different relation to the thing, relations which are incommensurable. In functional terms an axe is a “wood splitter.” But there is no determinate sense to the question, “What are the physical properties of a “wood splitter”?” because this is a function that multiple devices can perform—axes, manual wedges, hydraulic wedges, pneumatic

¹⁸Frank Jackson, “Epiphenomenal Qualia,” *Philosophical Quarterly* 32 (1982), 127–136.

¹⁹In his influential essay “Mental Events” (1970), Davidson argues that all mental events are physical events, but denies mental phenomena can be given “purely physical explanations.” Donald Davidson, “Mental Events,” in *Experience & Theory*, eds. Lawrence Foster and Joe William Swanson (Massachusetts: University of Massachusetts Press, 1970), 88. When challenged that his account was essentially epiphenomenalist, he denied it, arguing that his critics were maintaining an implausible view of causation; see Donald Davidson, “Thinking Causes,” in *Mental Causation*, eds. John Heil and Alfred Mele (Oxford, U.K.: Clarendon Press, 1993), 3–18.

²⁰In “Epiphenomenal Qualia,” Jackson defends the “qualia” argument against materialist reductionism (discussed later in this essay under “The Non-materialist Position”), but with the epiphenomenalist conclusion that qualia are causally inert in the physical world. His *petitio principii*, however, is that he assumes the materialist rejection of mental interactionism without any argument.

²¹Functionalism takes different forms, such as “machine state functionalism” (e.g., Hilary Putnam, “Minds and Machines,” in *Mind Language and Reality* [Cambridge, U.K.: Cambridge University Press, 1975], 362–385); “psychofunctionalism” (e.g., Terence Horgan and James Woodward, “Folk Psychology Is Here to Stay,” *Philosophical Review* 94.2 [April 1985]: 197–226); and “analytic functionalism” (briefly defended in Bernard W. Kobes, “Self-Attributes Help Constitute Mental Types,” *Behavioral and Brain Sciences* 16.1 [1993]: 55).

²²This is how Jerry A. Fodor explains functionalism in *Psychological Explanation: An Introduction to the Philosophy of Psychology* (New York: Random House, 1968), 111–116.

wedges, and others. “Wood splitter” is not an ordinary-language description of a device; it is a description of the function of any number of devices. By analogy, functionalism proposes that confusions could be avoided if we interpreted descriptions of mental states to refer not to properties of determinate faculties (brains or minds), but as attributions of psychological functions that mental states perform.²³

It is not that functionalists are agnostic on the question of whether mind is reducible to matter. Human mental states (such as beliefs, intentions, desires, and experiences) correspond to brain states; an intention or a belief is a function of the brain.²⁴ But just as concepts arising from a microanalysis of an axe do not replace the concept of a wood splitter, it would make less sense to ask whether the functional description is “reducible” to the physical description. Physically descriptive concepts arising from neurobiology, such as neural networks and synaptic connections, do not replace functional psychological concepts such as feelings and beliefs,

²³Jerry Fodor writes, “Philosophers and psychologists who have complained that it is possible to trace an input from afferent to central to efferent neurological systems without once encountering motives, strategies, drives, needs, hopes, along with the rest of the paraphernalia of psychological theories, have been right in one sense but wrong in another, just as one would be if one argued that a complete mechanical account of the operation of an internal-combustion engine never encounters such a thing as a valve lifter (i.e., the function of a camshaft).” *Psychological Explanation*, 114. In other words, motives, drives, and hopes are functions performed when neurons fire a particular way, just as “valve lifter” is a function performed when engines fire under specified conditions. A description of how an engine fires does not yet get us to the function of a camshaft. We have to ask the further question of what function the firing engine performs when in the configuration of a camshaft. Similarly, a description of the firing of neurons is not an explanation of the function of this particular motive, for example, of why I chose to marry Melissa rather than Christine, although it can be a description of the material conditions that corresponded in time to my experiencing the motive.

²⁴Functionalist Paul Churchland argues that positing an immaterial soul that exercises causality over the body violates the law of the conservation of momentum, requiring that any change in the motion of any physical particle be the result of some compensatory change in the motion of some other physical particle(s). Churchland writes, “In short, the empirical evidence indicates that the behavior of the physical world, including the brain, is closed under the laws of classical mechanics. There is no dynamical room available for the soul to work its magic.” “Cleansing Science,” *Inquiry* 48.5 (October 2005): 467–468. The problem with his argument is that it presumes a materialist system in which all variables are scientifically measurable. The anti-reductionist position I am defending rejects the assumption that the system in which consciousness operates is constituted of exclusively measurable variables. The conservation of energy does not legislate the forms of energy in a system, only the overall content in a closed system. If mental energy were essentially physical, then the expenditure of mental energy would change the measurable physical energy of the system. But my argument is precisely that mental energy has nonphysical and hence nonmeasurable properties. Mental energy expended does not change the content of measurable energy, since it is not a physical property and therefore is not measurable. Said in another way: If we begin with system Y with total energy P and assume X units of mental energy added to the system, we find that P is indeed conserved. The addition of X will not change P because X is not measurable. P is actually P + X, but since we have no measure for X it does not appear on either side of the equation. I thank Professor Daniel Robinson for assisting me in working out this argument.

nor can the latter be reduced to the former. These functional (psychological) states could as well (at least in principle) be realized in systems without brains, such as computers, brainless aliens, or robots, so long as the system is capable of realizing the particular function of a feeling or a belief. The fact that no computer presently can perform functions of higher consciousness is merely a technical problem which will eventually be overcome.²⁵

Functionalism in psychology is called *analytic behaviorism*, which holds that mental phenomena are nothing more than tendencies to behave in a particular way. So if we talk about the mental state of desire, we are talking about the tendency to seek the object desired; if we talk about the feeling of pain, we mean the tendency to behave in a way characteristic of those who talk of being in pain; if we talk about intention, we mean the tendency to carry out certain specified behaviors. Properly speaking there are no mental states, only dispositions to behave in certain ways.

Theories of *reductivist materialism* argue that the activity of mind is just the activity of brain. This is the case with *identity theory*, influential in the late 1950s and 1960s. It holds that mind and brain are identical. As such it denies the real existence of mental states and can therefore be referred to as *eliminativist*. Eliminativism argues that there really are not mental events and mental states, only physical events and physical states. Mental events just are neural events. The various descriptive concepts used to refer to mental states, concepts such as belief, experience, intention, and feeling, have unfortunately arisen from folk-psychology, which innocently but no less harmfully has developed discourse suggesting a distinct cognitive realm called the “mental” not reducible to the physical. Eliminativists argue that the concept of the mental and all derivative concepts (e.g., beliefs, intentions, feelings) should be eliminated from our vocabulary in favor of a more descriptively precise neuroscientific idiom.²⁶

²⁵Underlying the functionalist view is a computational model of consciousness. Computer languages operate on definable input-output codes signified by ones and zeros. Given the variability of extended combinations, the input-output mechanism gives rise to an almost infinite number of possible functional “states” for the computer. Mental events are conceived something like this. Two factors are decisive: (1) the beginning state of the machine (the brain), a state determined at any given time by the variability of genetics and environmental inputs; and (2) the input provided by some neural event precipitated by some physical stimulus. The beginning state and the input stimulus together give rise to a mental state (the output) that is in principle predictable, i.e., is nothing more than a brain process under special conditions. The focus for the functionalist, however, is not the disposition of the brain but rather the functional role being performed by the state, which can in principle be identical across a variety of systems. In opposition, Oderberg argues that there is no good reason for concluding that what humans do and what computers do is fundamentally the same. Rather, the “phenomenological evidence in the human case is so strong that we have a priori reason for thinking that *whatever* physical model is proposed, it will not capture what we do.” “Hylemorphic Dualism,” 74.

²⁶P. Churchland, “Eliminative Materialism and the Propositional Attitudes,” *Journal of Philosophy* 78.2 (February 1981): 67–90. Horgan and Woodward argue persuasively against Churchland’s (and Stich’s) eliminativist rejection of folk psychology in “Folk Psychology Is Here to Stay,” 197–226.

The Non-materialist Position

Most critics of the materialist position today argue from the non-materialist premise that mental states can be accounted for by both physical and nonphysical explanations. David Chalmers, a leading critic in the philosophy of mind, argues that the uniqueness of phenomenal consciousness demonstrates some fundamental component irreducible to physical properties: “a complete theory [of everything] will have two components: physical laws, telling us about the behavior of physical systems . . . and . . . psychophysical laws, telling us how some of those systems are associated with conscious experience.”²⁷ He distinguishes between what he calls “easy problems” of consciousness and the “hard problem.” Easy problems include our ability to discriminate and categorize, to react on the basis of external input, to focus our attention, integrate information, and control behavior. These, he argues, can be explained in scientific terms: “all of them are straightforwardly vulnerable to explanation in terms of computational or neural mechanisms.”²⁸ But not all elements of consciousness can be accounted for so easily. “The really hard problem of consciousness is the problem of *experience*.”²⁹ In the philosophy of mind this is referred to as the problem of *qualia*.³⁰ The term “qualia” refers to the qualitative properties of our mental states, phenomenal experiences like the feeling of pain, dreading of an event, tasting of a lemon, smelling of a rose, or seeing of the blueness of the sky.³¹ Critics of materialism argue that qualia cannot be explained in terms of neurophysiology.³² Notwithstanding all the complexity of neural (particularly cortical) function, there is an irreducible difference between neural activity on the one hand and our felt inner

²⁷David J. Chalmers, “The Puzzle of Conscious Experience,” *Scientific American* 12.1 (April 2002): 96.

²⁸David J. Chalmers, “Facing Up to the Problem of Consciousness,” *Journal of Consciousness Studies* 2.3 (1995): 201.

²⁹Ibid.

³⁰See Thomas Nagel’s seminal essay, “What Is It Like to Be a Bat?” *Philosophical Review* 83.4 (October 1974), 435–450.

³¹*Routledge Encyclopedia of Philosophy*, ed. E. Craig (London: Routledge, 1998), s.v. “Qualia” (by Janet Levin). Different scholars have replied to the qualia argument; see Jonathan C. W. Edwards, “Is Consciousness Only a Property of Individual Cells?” *Journal of Consciousness Studies* 12.4–5 (2005): 60–76. Churchland replies by arguing that qualia, rather than constituting distinct types of phenomenal consciousness, are different types, mediums, or levels of representation of brain states; see Churchland, *Matter and Consciousness: A Contemporary Introduction to the Philosophy of Mind*, rev. ed. (Cambridge, MA: MIT Press, 1988), 34. Defenders of the qualia argument would reply that it is precisely the inadequacy of brain states to account for why phenomenal consciousness is experienced as it that gives rise to the qualia argument in the first place.

³²Galen Strawson writes, “The existence of experience is the only hard part of the mind-body problem for materialists. . . . The things we think of as higher intellectual achievements are just not a philosophical problem, except in so far as they involve a capacity for experience.” *Mental Reality* (Cambridge, MA: MIT Press, 1994), quoted in Haldane, “Metaphysics of Intellect(ion),” 44.

experience of self and the world on the other.³³ “Physical form and function add up to more physical form and function.”³⁴ The uniqueness of phenomenal consciousness leads neuropsychiatrist Jeffrey Schwartz to conclude that “consciousness is an ontological fundamental—that is, a primary element of reality.”³⁵

Ancient and medieval philosophers also identify easy and hard problems of consciousness but draw the line at a different place from proponents of the qualia argument. Aristotle and Aquinas, for example, hold that all forms of per se sensory cognition (including acts of perception and emotion) are accounted for by acts of the body.³⁶ This includes memory, imagination, and all affective phenomena. Wallace Matson argues that this is the unanimous consensus of all the ancients.³⁷ John Haldane (quoting Anthony Kenny) says the consensus held all the way to Descartes.³⁸ It seems that to the ancients and medievals the problem of qualia was accounted for broadly within a physicalist paradigm.³⁹

Yet there was one act of cognition they thought impossible to account for within a physicalist system. It was not an act of perception, not an act where any sensible thing is cognitively represented. Rather, it was the act by which both sensible and

³³ An early influential essay arguing for the uniqueness of qualia in studies of consciousness is Joseph Levine’s “Materialism and Qualia: The Explanatory Gap,” *Pacific Philosophical Quarterly* 64 (1983): 354–361. Levine argues that a materialist account is simply unable to fully explain phenomenal consciousness and so invariably leaves us with an explanatory gap when it comes to accounting for qualia. See also Levine’s later essay “Conceivability, Identity, and the Explanatory Gap,” in *Toward a Science of Consciousness III: The Third Tucson Discussions and Debates*, eds. Stuart R. Hameroff, Alfred W. Kaszniak, and David J. Chalmers (Cambridge, MA: MIT Press, 1999), 3–12.

³⁴ David J. Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (New York: Oxford University Press, 1996), quoted in Schwartz and Begley, *Mind and Brain*, 46–47.

³⁵ Schwartz and Begley, *Mind and Brain*, 47.

³⁶ Aquinas writes, “Sensuality is defined as *the appetite of things belonging to the body*” (*Summa theologiae*, I, Q 81.1, emphasis added), and again, “passion . . . is only in respect of a bodily transmutation [i.e., change in bodily state]” (*Summa theologiae*, I-II, Q 22.1, reply 1; see also *Summa contra gentiles*, I, Q 89, nn. 3 and 6).

³⁷ “In the whole classical corpus there exists no denial of the view that sensing is a bodily process throughout. . . . The Greeks did not lack a concept of mind, even of a mind separable from the body. But from Homer to Aristotle the line between mind and body, when drawn at all, was drawn so as to put the processes of sense-perception on the side of the body.” Wallace Matson, “Why Isn’t the Mind-Body Problem Ancient?” in *Mind, Matter, and Method*, eds. P. Feyerabend and G. Maxwell (Minneapolis: University of Minnesota Press, 1966), 93 and 96.

³⁸ Haldane, “Metaphysics of Intellect(ion),” 46.

³⁹ Although there is no dispute over whether Aquinas held that perception is accountable through acts of the body, scholars differ on whether acts of perception are reducible to bodily states. Some, like Oderberg (and myself), hold they are, others that they presuppose such states but as psychic entities are not reducible to them. See Oderberg, “Hylemorphic Dualism,” 86.

non-sensible things are *understood*. If the act of understanding is not accounted for within a physicalist system, the faculty by which the act is performed cannot be anything physical. The human intellect therefore must be immaterial. For Aristotle and Aquinas, this conclusion followed with deductive certitude. But as I said above, the conclusion is almost universally rejected in contemporary scientific and philosophical literature. Philosophical critics, however, are arguing against the wrong interlocutor. Aquinas's non-materialist account—and not the Cartesian dualist account—is the more cogent but less frequently engaged. My purpose for the remainder of this essay is to re-present Aquinas's best argument for immateriality. I will show how his conclusion on the nature of the intellect follows from the nature of the act of intellection. It will be clear that a materialist account of human cognition simply cannot account for acts of understanding.⁴⁰

Aquinas's Argument from Universalized Concepts

Aquinas sets forth three main arguments against the materialist conclusion, one of which, the strongest in my judgment, I advance here.⁴¹ In short, he argues that a power capable of forming universal concepts cannot contain within itself anything material. His most developed formulation of this argument is found in the *Summa theologiae*:

⁴⁰See Aristotle, *Generation of Animals*, bk. II, ch. 3, 736 b28: “for no bodily activity has any connexion with the activity of reason.” *The Complete Works of Aristotle: The Revised Oxford Translation*, vol. 1, ed. Jonathan Barnes (Princeton, NJ: Princeton University Press, 1984), 1143; see *De anima*, bk. II, ch. 1, 413a6–7, 657.

⁴¹The first is his argument from the universality of the scope of human cognition (*Summa theologiae*, I, Q 75.2). The argument begins with two reasonable propositions, which act as middle terms of Aquinas's argument: intellectual knowledge includes knowledge of all bodily things; and knowledge is not only of individuated entities, but also of kinds, that is, of natures. His major premise argues that whatever can know the natures of all bodily things must not have anything bodily in its own nature, because if it did, the bodily nature would impede knowledge of any other bodily nature. The conclusion follows that the intellect must be free of all bodily nature. Aquinas supports his argument by appealing to an analogy from the senses: one whose tongue has grown bitter from fever is unable to taste sweetness; the bitterness prevents all other tastes from being picked up; it follows that for the tongue to taste anything, its own nature must be free of all tastes; he uses a similar analogy with the eye: if the eye were not free of color, it would not be able to see all colors. Similarly, since intellectual cognition is the chief power of the intellect, in order for the intellect to know all bodies it cannot have any bodily nature in it. If the intellect were bodily or contained bodily-ness, its own bodily nature would impede all other knowledge of bodies. But since it plainly can know all bodily things, it must itself be free of everything bodily. Aquinas's second is his argument from knowledge of universalized concepts (*Summa theologiae*, I, Q 75.5). His third is his argument from self-knowledge (*Commentary on the Book of Causes*, proposition 7). I am interested in the second argument. For additional but less important arguments, see *Summa contra gentiles*, bk. II, ch. 49, and *Commentary on Aristotle's De anima*, bk. 3, lecture 7, n. 10 (n. 680).

Whatever is received into something is received according to the condition of the recipient. Now a thing is known in as far as its form is in the knower. But the intellectual soul knows a thing in its nature absolutely: for instance, it knows a stone absolutely as a stone; and therefore the form of a stone absolutely, as to its proper formal idea, is in the intellectual soul. Therefore the intellectual soul itself is an absolute form, and not something composed of matter and form. For if the intellectual soul were composed of matter and form, the forms of things would be received into it as individuals, and so it would only know the individual: just as it happens with the sensitive powers which receive forms in a corporeal organ; since matter is the principle by which forms are individualized. It follows, therefore, that the intellectual soul, and every intellectual substance which has knowledge of forms absolutely, is exempt from composition of matter and form.⁴²

I will attempt to reformulate this argument in terms more consistent with a contemporary idiom.

We can reconstruct Aquinas's argument as follows:⁴³

1. Cognition includes receiving information pertaining to particular entities not only as particulars, but also as kinds (that is, it includes knowing the natures of things).
2. The act by which we know a thing's nature is the act of forming universalized concepts.
3. Now, a particular entity can only be perceived as particular because it is materially instantiated (that is, it is perceived as a particular by way of its materiality).
4. A universalized concept is universal precisely because it is abstracted from particularity and hence materiality.
5. That which has cognition of a materially instantiated particular can have it only by receiving information into itself pertaining to the principle of the entity's particularity, namely, its materiality (sensation).
6. The act by which a cognitive power receives particular information pertaining to a thing's materiality must be a materially instantiated act.
7. The power by which a thing carries out materially instantiated acts must itself be materially instantiated.
8. The act by which a cognitive power receives information free from everything material must itself be free from everything material (intellection).
9. In the formation of universalized concepts the intellect receives information free from everything material.
10. The act of concept formation therefore is free from everything material.

⁴²Aquinas, *Summa theologiae*, I, Q 75.5.

⁴³I do not follow Aquinas's exact sequence of propositions but rather reformulate his argument around the central idea that knowledge of universals can be actualized only by a power free of material composition.

11. Something able to act free from everything material must itself be free from everything material.
12. The intellect, as capable of forming universalized concepts, is free from everything material.

The first proposition states that human cognition includes not only retaining information that pertains to particular things as particulars (this short, black, furry thing), but also information that pertains to the kinds of things they are (e.g., cat). So we are able not only to perceive a thing in its individuality, but also to know it by identifying it as a particular instance of an abstract kind. The second proposition states that we arrive at this abstracted knowledge through the formation of universalized concepts. So, having processed sensory information received from experiencing repeated interactions with cats or images of cats, I form the concept of felinity. I then associate the universalized concept with instances of cats with which I come into sensory contact. I am thus able both to perceive Felix as this short, black, furry thing, and to know her as my *cat*.

The third proposition is independent of the first two. It asserts that particular things can be perceived in their particularity only because they are instantiated as particulars by their materiality. It is precisely their material existence (i.e., their spatiotemporal sensibility) that makes them perceptible. Abstracted from their sensible qualities, particular things are not objects of perception and not perceptible as particulars. In a related way, proposition four states that universalized concepts as forms of cognition abstracted from the particularity that materiality actualizes cannot contain any information pertaining to the material particularity of any individuated thing.⁴⁴

Following from number three, proposition five asserts that in order to perceive a material thing in its particularity (that is, to perceive its sensible natures), a cognitive power must receive and encode information about it. The power must take into itself something *of the thing* in order to perceive it through sensory cognition. Aquinas (with Aristotle) says we receive the thing's *sensible form* detached from its corresponding matter. It follows that we have sensory cognition of a thing in its particularity inasmuch as its sensible form is *in* our cognitions. Saying that the thing is in our cognitions implies that there is a difference between the way the object exists in the world and the way it exists in us. Aquinas calls this the first *natural existence* and the second *intentional existence*. The sensible form therefore has *intentional existence* in our sensory cognitions. The intentional existence of a sensible thing, say, a green apple, is constituted by the sensible features of the apple as encoded in the brain through the mediation of the sense organs; call it a sensory representation.⁴⁵ It follows (proposition six) that this encoding of data of the material features

⁴⁴See also Aquinas's *Commentary on Aristotle's De anima*, bk. II, lect. 12, n. 378.

⁴⁵I am using this term widely to include all representations of particular things, including simple sensory representations arising from the activity of individual senses (e.g., the color green or sourness) as well as more complex representations in which individual sensations are, as it were, collected, distinguished from each other, brought together, and

of sensible things is a materially instantiated act. The act of encoding includes the activity of the senses of sight, hearing, olfaction, taste, and touch. Sense information enters the body through receptors; signals are transmitted to the brain via the actions of neurons and the transfer of signals by chemical and electrical synapses and release of neurotransmitters. Processing and storage (or encoding) of information takes place in the brain.⁴⁶

The sensory image acts as a symbolic representation in our cognitions of the thing as it exists or we imagine it to exist outside our cognitions. Like any symbol, it is a thing that stands for something else. The cognitive image as it exists in our sensory system is just neurological activity and precise neural firing patterns. What the neural activity represents to us are the sensible features of the perceptual or imaginal world. It represents things instantiated by materiality. The encodable bits of data represent colors, textures, odors, flavors, temperatures, spatial orientations, sizes, densities, etc., often (but not always⁴⁷) united into perceptual wholes. It follows (proposition seven) that the powers (sense organs and biochemical and neurological networks) that carry out these materially instantiated acts are themselves materially instantiated. They are bodily acts.

We now come to the pivotal insight of Aquinas's argument. Just as an act receptive of information pertaining to the sensible features of material things must be an act that is materially instantiated, it follows that the act in which our intellect receives information free from everything material must be free from materiality. Universalized concepts are contents of thought that contain information free from all the sensible manifestations of material things (free from every spatiotemporal representation). Since matter is the principle of individuation of particular things,⁴⁸ and nothing pertaining to the particularity of an individuated thing is contained in a

united into perceptual wholes, called perceptual representations (e.g., a green apple). Gyula Klima explains the encoding of sensible features in a similar way in "Aquinas's Proofs of the Immateriality of the Intellect from the Universality of Human Thought," *Proceedings of the Society for Medieval Logic and Metaphysics* 1 (2001), 26.

⁴⁶For an account of how memories are encoded in the brain, see Siegel, *Developing Mind*, ch. 2, on memory.

⁴⁷The coding of neurological firing patterns (or engrams) in infants takes place through a process called "implicit memory," which does not involve parts of the brain involved in *conscious* processing. Repeated experiences cause the infant's brain to make "summations" or "generalized representations." These generalizations are the basis of mental models which the infant brain uses to interpret experiences. The later activation of these neural profiles through sensory triggers produces a feeling in the adult that does not correspond to any conscious memory the adult can recall; such experiences become an everyday part of the adult's experiential life: "These implicit elements form part of the foundation of our subjective sense of ourselves. We act, feel, and imagine without recognition of the influence of past experience on our present reality." Siegel, *Developing Mind*, 29.

⁴⁸Pasnau argues that it is *not* Aquinas's view that matter is the principle of individuation for material things, but rather that substantial form individuates a substance; see "Comments on Gyula Klima, 'Aquinas's Proofs of the Immateriality of Intellect,'" *Proceedings of the Society for Medieval Logic and Metaphysics* 1 (2001), 29–36, esp. 32.

universalized concept, it follows that nothing pertaining to materiality is contained in our universal conceptions. The intellect begins with sensible data cloaked in the concrete conditions of materiality and proceeds to form a universalized concept stripped of all sensible data, free from all the concrete conditions of matter. In this way we form both semantically complex concepts like the concept of a black dog and simple ones like the concept of unity, being, or identity.⁴⁹ We form spatial concepts like the concept *up* from our interaction with the environment, for example, from the repeated motor functions of standing erect and sitting, raising our hands, gesturing toward the ceiling, and pointing skyward.⁵⁰

So from our cognitions of particular materially instantiated realities we come by means of concept formation to an *understanding* of those realities. The concept is that by which we understand the data of phenomenal consciousness. It is the intellectual actualization of a thing's intelligibility. But a thing's intelligibility, its whatness, precisely as understood has no phenomenal existence in the world, only intentional existence in the intellect.⁵¹ That existence signifies the universality by which particulars are understood. But the universal by definition excludes the particular and that by which the particular is instantiated (namely, materiality). A universalized concept therefore is empty of sensible content. If there is nothing sensible to represent, no extension, volume, density, color, texture, odor, flavor or sound, no perceptual whole, no spatiotemporal relation, literally nothing sensibly encodable, then there is no apt information to convert into a representational form and transmit and store. Yet the conceptual content is not empty. It is not that there are no data in a universal concept, only that the data are not encodable in the form of a cognitive representation. They pertain to nothing individual.

This principle is at the heart of Aquinas's argument: if the intellect contained matter, it could only receive information pertaining to individual materially instantiated things and so would only be capable of knowing individual things, as is the case with objects of sensory perception. I am arguing that the principle should be understood as asserting that only data pertaining to a thing's particular material sensibility are capable of being materially (neurologically) received, transmitted, and encoded.⁵² It follows that if there is nothing pertaining to sense data to receive,

⁴⁹For a discussion of the two types of concepts, see Oderberg, "Hylemorphic Dualism," 89.

⁵⁰George Lakoff and Mark Johnson, *Metaphors We Live By*, 2nd ed. (Chicago: University of Chicago Press, 2003), 57.

⁵¹In Aquinas the concept itself is not an object of understanding, but that by which we understand an object of experience. In bringing forth concepts, we bring forth understanding. This can be distinguished from the idealist view that the idea or concept itself is what we know; this latter view is illustrated in Locke's assertion that an "*idea* . . . is the Object of the Understanding when a Man thinks." See his *An Essay Concerning Human Understanding*, ed. P. Nidditch (Oxford: Clarendon Press, 1975), bk. 1, ch. 1, par. 8 (p. 47).

⁵²By "thing" Aquinas would include hybrid representations, such as unicorns, which arise from the imagination's power to combine data from the senses into novel representations with no actual existence in the world.

there is nothing to transmit and encode by the acts of bodily powers. Universalized concepts contain nothing pertaining to sense data. It follows that concept formation and storage are not bodily acts, and they therefore take place by something other than acts of the body (proposition ten).⁵³ If the act is free from everything material, the power by which the act is performed is free from everything material (proposition eleven). The intellect, therefore, insofar as it is capable of acts which are free from everything material, must itself be free from everything material (proposition twelve).

Bodily Activity: Necessary but Not Sufficient

Neuroscientists have generated a great deal of data identifying neurophysiological correlates associated with different types of abstract reasoning.⁵⁴ Using (primarily) functional magnetic resonance imagining (fMRI) to scan brain activity (and sometimes positron emission tomography, or PET, scans), subjects are asked to perform various types of mental tasks (e.g., deductive reasoning involving abstract sentences, solving algebra problems, analysis of positions of pieces in a chess game, assessment of the strength of an inductive conclusion from certain premises) and

⁵³Oderberg argues similarly: "There is an essential ontological mismatch between the proper objects of intellectual activity ... and any kind of potential physical embodiment of them: we might call this the *embodiment problem*, but looked at in a slightly narrower way, in cognitive-scientific terms, it might be called the location or storage problem. Concepts, propositions, and arguments are abstract; potential material loci for these items are concrete. The former are unextended; the latter are extended. The former are universals; the latter are particular. Nothing that is abstract, unextended, and universal ... could be embodied, located, or stored in anything concrete, extended, and particular. Therefore, the proper objects of intellectual activity can have no material embodiment or locus." "Hylemorphic Dualism," 89.

⁵⁴Several prominent studies include V. Goel et al., "Neuroanatomical Correlates of Human Reasoning," *Journal of Cognitive Neuroscience* 10.3 (May 1998): 293–302; Goel et al., "The Seats of Reason? An Imaging Study of Deductive and Inductive Reasoning," *NeuroReport* 8.5 (March 24, 1997): 1305–1310; S. Bunge et al., "Neural Circuits Subserving the Retrieval and Maintenance of Abstract Rules," *Journal of Neurophysiology* 90.5 (November 2003): 3419–3428; Q. Luo et al., "The Neural Substrate of Analogical Reasoning: An fMRI Study," *Cognitive Brain Research* 17.3 (October 2003): 527–534; T. Fangmeier et al., "fMRI Evidence for a Three-Stage Model of Deductive Reasoning," *Journal of Cognitive Neuroscience*, 18.3 (March 2006): 320–334; V. Goel and R. J. Dolan, "Functional Neuroanatomy of Three-Term Relational Reasoning," *Neuropsychologia* 39.9 (2001): 901–909; V. Goel, "Cognitive Neuroscience of Deductive Reasoning," in *Cambridge Handbook of Thinking and Reasoning*, eds. K. Holyoak and R. Morrison (Cambridge, UK: Cambridge University Press, 2005), 475–493; A. Green et al., "Frontopolar Cortex Mediates Abstract Integration in Analogy," *Brain Research* 1096.1 (June 22, 2006): 125–137; V. Prabhakaran, B. Rypma, and J.D. Gabrieli, "Neural Substrates of Mathematical Reasoning: A Functional Magnetic Resonance Imaging Study of Neocortical Activation during Performance of the Necessary Arithmetic Operations Test," *Neuropsychology* 15.1 (January 2001): 115–127; J.F. Danker and J.R. Anderson, "The Roles of Prefrontal and Posterior Parietal Cortex in Algebra Problem Solving: A Case of Using Cognitive Modeling to Inform Neuroimaging Data," *Neuroimage*

the areas of the brain that light up are noted. The evidence confirms that abstract reasoning involves the prefrontal cortex of the frontal lobe of the brain (responsible for working memory, personality expression, moderation of social behavior)⁵⁵ in collaboration with structures in the temporal lobe (language and auditory processing),⁵⁶ parietal lobe (manipulation of spatial information),⁵⁷ and occipital lobe (visual processing).⁵⁸ The picture that emerges is one of a multi-cortical process involving the memorial-language (syntactic) system and the visuospatial system of the brain.⁵⁹

A non-materialist account can consistently accommodate these data. For Aquinas, all conceptual knowledge necessarily arises from the senses. And sense representations are necessarily material. To be understood they need to be “made” immaterial. They are, as it were, surrounded by all the conditions of materiality: they are particular, frozen in time and space, individuated, characterizable in terms of shape, size, and distance and in terms of color, sound, flavor, odor, and feel. The formation of a universal concept requires these accidents of materiality to be stripped away. In the process an image is reduced from being potentially intelligible to being actually intelligible. The “what” of it is abstracted from the material conditions in which it is embedded. In Aquinas’s language the intellect abstracts the intelligible form from the sensible form. To do this it must necessarily operate in relation to sensible images (i.e., cognitive representations called phantasms preserved in the sensory structures of the brain). The intellect sets aside the data that bind the phantasm to the world of the particular, peels back the concrete determinate qualities of corporeal things, and in so doing, unveils the realm of the universal or, in Aquinas’s term, of intelligible “forms.” It is not until the form of the thing is abstracted that understanding can take place, since understanding concerns natures and sensation only concerns particulars. Having received the intelligible form, the intellect in an act of its own brings forth what it receives in the form of the intelligible species of an *idea* or *concept*.⁶⁰

35.3 (April 15, 2007): 1365–1377; O. Houdé et al., “Access to Deductive Logic Depends on a Right Ventromedial Prefrontal Area Devoted to Emotion and Feeling: Evidence from a Training Paradigm,” *Neuroimage* 14.6 (December 2001): 1486–1492; V. Goel and R. Dolan, “Differential Involvement of Left Prefrontal Cortex in Inductive and Deductive Reasoning,” *Cognition* 93.3 (October 2004): B109–B121; M. Delazer et al., “Learning Complex Arithmetic: An fMRI Study,” *Cognitive Brain Research* 18.1 (December 2003): 76–88; M. Atherton et al., “A Functional MRI Study of High-Level Cognition, I: The Game of Chess,” *Cognitive Brain Research* 16.1 (March 2003): 26–31; J.D. Wallis, K.C. Anderson, and E.K. Miller, “Single Neurons in Prefrontal Cortex Encode Abstract Rules,” *Nature* 411.6840 (June 21, 2001), 953–956 (research carried out on primates).

⁵⁵ See, for example, Goel et al., “Seats of Reason?” 1308.

⁵⁶ See Prabhakaran, Rypma, and Gabrieli, “Neural Substrates,” 115–127.

⁵⁷ Bunge et al., “Neural Circuits,” 3425.

⁵⁸ Goel and Dolan, “Functional Neuroanatomy,” 904–906.

⁵⁹ Goel, “Cognitive Neuroscience,” 475–493.

⁶⁰ For a lucid presentation of Aquinas’s conception of the formation of ideas, see Robert E. Brennan, *Thomistic Psychology: A Philosophic Analysis of the Nature of Man* (New York: Macmillan, 1941), ch. 7.

All knowing therefore entails interaction between the intellect and cortical structures responsible for sensory cognition, especially structures that encode, preserve, and retrieve the images of sentient life. Neuroscience tells us that abstract reasoning arises in the memorial-language (syntactic) system and the visuospatial system of the brain. Unfortunately, the normative assumption is that the cortical activity sufficiently accounts for that reasoning.⁶¹ But Aquinas's account gives reason to deny that material structures are capable of encoding, retrieving, and manipulating universalized concepts and therefore argues that the neuroscientific explanation can only partially account for higher acts of human cognition. It accounts for the encoding, preserving, and retrieval of the sensible images employed by the intellect. The scientific data justify the conclusion that these acts of cognition are carried out in the memorial-syntactic and visuospatial systems of the brain. But a scientific explanation does not account for intellectual acts per se, for the knowing and manipulation of abstract ideas. For this a power is needed that is not limited by conditions necessarily imposed by materiality.

We therefore arrive at the non-materialist conclusion that in the formation and manipulation of universal concepts, material and immaterial faculties seamlessly interact in such a way as to elevate the cognition from the remarkably complex form of animal knowing we call perception to the godlike form of cognition we call intellectual understanding.

⁶¹ Acknowledging the limitations of present imaging technology, the literature is generally modest in what it asserts can be known of the correlations between cognition and brain activity.