

FROM LOCKE TO MATERIALISM: EMPIRICISM, THE BRAIN AND THE STIRRINGS OF ONTOLOGY

Charles T. Wolfe
Centre for History of Science,
Department of Philosophy and Moral Sciences
Ghent University
Associate, Unit for History and Philosophy of Science
University of Sydney
charles.wolfe@ugent.be

For a volume on *18th-Century Empiricism and the Sciences*
edited by A.-L. Rey and S. Bodenmann
Dordrecht: Springer

Abstract

My topic is the materialist appropriation of empiricism – as conveyed in the ‘minimal credo’ *nihil est in intellectu quod non fuerit in sensu* (which is not just a phrase repeated from Hobbes and Locke to Diderot, but significantly, is also a medical phrase used by Harvey, Mandeville and others). That is, canonical empiricists like Locke go out of their way to state that their project to investigate and articulate the ‘logic of ideas’ is *not a scientific project*: “I shall not at present meddle with the Physical consideration of the Mind” (Locke 1975, I.i.2), which Kant gets exactly wrong in his reading of Locke, in the Preface to the A edition of the first *Critique*. Indeed, I have suggested elsewhere, contrary to a prevalent reading of Locke, that the *Essay* is not the extension to the study of the mind of natural-philosophical methods; that he is actually not the “underlabourer” of Newton and Boyle he claims politely to be in the Epistle to the Reader (Wolfe and Salter 2009, Wolfe 2010). Rather, Locke says quite directly, “Our Business here is not to know all things, but those which concern our Conduct” (Locke 1975, I.i.6). There is more to say here about what this implies for our understanding of empiricism (see Norton 1981 and Gaukroger 2005), but instead I shall focus on a different aspect of this episode: how a non-naturalistic claim which belongs to what we now call *epistemology* (a claim about the senses as the source of knowledge) becomes an *ontology* – materialism. That is, how an empiricist claim could shift from being about the sources of knowledge to being about the nature of reality (and/or the mind, in which case it needs, as Hartley saw and Diderot stated more overtly, an account of the relation between mental processes and the *brain*). (David Armstrong, for one, denied that there could be an identification between empiricism and materialism on this point [Armstrong 1968, 1978]: eighteenth-century history of science seems to prove him wrong.) Put differently, I want to examine the shift from Locke’s logic of ideas to an eighteenth-century focus on what kind of ‘world’ the senses give us (Condillac), to an assertion that there is only one substance in the universe (Diderot, giving a materialist cast to Spinozism), and that we need an account of the material substrate of mental life. This is neither a ‘scientific empiricism’ nor a linear developmental process from philosophical empiricism to natural science, but something else again: the unpredictable emergence of an ontology on empiricist grounds.

In what follows I seek to reconstruct and delineate a line of development running from core empiricist claims which we would now identify as ‘epistemological’, such as Locke’s claim in the *Essay Concerning Human Understanding* (first edition 1689), that “There appear not to be any ideas in the mind before the senses have conveyed any in,”¹ to more ‘ontologized’, materialist claims in the mid-eighteenth century, as in La Mettrie, Diderot or, less well-known, the heterodox Benedictine monk Dom Deschamps, for whom “sensation and the idea we have of objects are nothing other than these objects themselves, inasmuch as they compose us, and act on our parts, which are themselves always acting on one another.”² Diderot further ‘objectifies’ empiricism, claiming that matter itself can sense (while also granting the brain a special status) and, like Deschamps, that the senses do not open onto a space of subjectivity but rather onto the world. What interests me here is how a doctrine of the senses as a source of knowledge – an *epistemology* – becomes an *ontology* (specifically, materialism), through a process of ‘ontologization’, in which the emphasis and motivation of the theory are increasingly less on how the subject ‘furnishes the mind’ (a Lockean phrase not quite found in Locke³), and more on locating mind, sensation and brain in the natural world. It is a shift from an investigation of the sources of knowledge to a focus on the nature of actual, embodied entities,⁴ or differently put, from a logic of ideas (Locke) to a focus on what kind of ‘world’ the senses give us (Condillac), to an assertion that the senses lead to a metaphysics (Diderot), in which the Lucretian theme of the infallibility of sensation is revived.

However, in this process of ontologization, which is also the emergence of a specifically *materialist* appropriation of the core empiricist claim *nihil est in intellectu quod non fuerit in sensu* (a phrase discussed in detail below, in section 3 in particular), we do not encounter, contrary to a common view in philosophy of science (e.g. Nagel 2006, 236), a direct articulation between empiricism (as a position or set of positions on the relation

¹ Locke 1975, II.i.23.

² Deschamps 1993, 404. Unless otherwise indicated all translations are my own.

³ Later on, Hume and Reid use the expression “furniture of the human understanding”; the earliest usage I am aware of is Cudworth’s, in his unpublished *Treatise Concerning Eternal and Immutable Morality*, begun in the 1660s (“the Soul is not a meer *Rasa Tabula*, a Naked and Passive Thing, which has no innate Furniture or Activity of its own”; Cudworth 1731, 175-176, 287).

⁴ I have found the discussion of empiricism and materialism in Armstrong 1978 quite useful. There is a different sense in which, since Locke has an account of minds, matter, powers and the like, he “has” an ontology (Downing 2007) although he is not *an ontologist* as understood here. Yet we should also be suspicious of applying these categories unproblematically to the early modern period: see Haakonssen’s criticism of the “epistemological paradigm,” which “sees philosophy as essentially concerned with the justification of beliefs and judgements,” and “tends to apply this idea of epistemological justification as the criterion for what is properly included in the discipline of philosophy” (Haakonssen 2006, 7).

between the senses, experience and knowledge) and science, whether the latter is understood as an assemblage of theories or as a set of practices. For instance, as we shall see, it is a conceptual *and* a historical mistake to claim that Lockean empiricism influences and contributes to the birth of neuroscience (as in Lega 2006); but it is possible to study interrelations between the analysis of associative mechanisms and ‘fantasy’ in Locke, and other, more neurophysiological accounts of the functioning of animal spirits (as in Sutton 2010). Complicating this story of the relations between empiricism and science is the fact that the *nihil est...* phrase occurs frequently, almost as a slogan, in a variety of medical texts. To mention one example among many (and I will return to the medical dimension of this phrase in section 3), the vitalist physician Ménéret de Chambaud ties the phrase to the practice of observation and experiment in medicine: in the programmatic article “Observation” in the *Encyclopédie*, he asserts that medical observation-and-experiment are the extension of the “axiom” that “there is nothing in the mind that was not first in the senses.”⁵ Again, despite the complexity of these medical articulations of empiricism, I want to insist that there is no direct, causal or conceptual link between ‘empiricism’ and ‘science’, until the former has been ontologized and joined to an account of the brain. But let us begin with Locke.

1. Lockean empiricism is not the handmaiden of science

Lockean empiricism is in no way either a program for science, an ancillary door-keeper for a nascent philosophical materialism, or an analysis of the ‘logic of ideas’ which seeks to relate their association and functioning to processes in the brain, as David Hartley notably tried to do in his 1749 *Observations on Man*.⁶ All of these readings are still common, and they come in a range of intensities. Some are contestable on interpretive grounds rather than factually; so, for instance, a number of interpreters of Locke continue to take literally a self-description he gives in the *Essay*’s Epistle to the Reader, where he presents himself as the “underlabourer” of the natural sciences, as compared to the “master-builders” of the science of his time. In contrast, I think a much deeper motivation, which makes sense of much more

⁵ Ménéret, “Observation,” *Enc. XI*, 314b. Diderot also refers to this as an “axiom” in several places, including the article “Locke.”

⁶ This was also noted at the end of the eighteenth century by Joseph Priestley, for whom “what was essential to the Lockean project . . . was the tracing of ideas to their source in sensation; and David Hartley’s *Observations on Man* showed how this was to be done” (Harris 2005, 16). Marx already emphasizes the trajectory from Locke to Hartley and Priestley in *The Holy Family*, drawing on Renouvier, as noted by Olivier Bloch and reiterated in Thomson 2008.

of Locke's work, is less 'science-friendly', as it indicates that the *Essay* is a fundamentally *moral* project.

Recall that in the Epistle to the Reader, Locke speaks of the "master-builders" in the "commonwealth of learning," whose "mighty designs in advancing the sciences, will leave lasting monuments to the admiration of posterity"; however, everyone should "not hope to be a Boyle, or a Sydenham," or "the great Huygenius, [or] the incomparable Mr. Newton." Rather, "*it is ambition enough to be employed as an under-labourer in clearing the ground a little, and removing some of the rubbish that lies in the way to knowledge.*"⁷ The 'under-labourer' passage has had an enormous impact on how Locke is viewed. For it seems to define the empiricist project as an adjacent, indeed subaltern project to the modern corpuscular reductive project: on this view, Locke treated the world of ideas as these great men treated to the world of natural objects, and many interpreters have followed this 'hint'.⁸

But one can also choose to follow the hint he gives in the same text, about how this work emerged in response to discussions amongst his small group of friends in his "chamber":

*Were it fit to trouble thee with the history of this Essay, I should tell thee, that five or six friends meeting at my chamber, and discoursing on a subject very remote from this, found themselves quickly at a stand, by the difficulties that rose on every side. After we had a while puzzled ourselves, without coming any nearer a resolution of those doubts which perplexed us, it came into my thoughts, that we took a wrong course; and that before we set ourselves upon inquiries of that nature, it was necessary to examine our own abilities, and see what objects our understandings were, or were not, fitted to deal with.*⁹

What is the "remote subject" on which the friends discoursed? A copy of the *Essay* owned by one of these friends, James Tyrrell, bears in the margin at this spot, the words "*morality and revealed religion*"¹⁰ ... which tallies rather nicely with a variety of passages in the *Essay* that stress its 'practical' motivation: to focus on a better understanding of the functioning of the

⁷ Locke 1975, 9, emphasis mine. Stephen Gaukroger notes that the underlabourer figure is almost a trope in the works of the period, citing Boyle's willingness to "not only be an Underbuilder, but ev'n dig in the Quarries for Materials towards so useful a Structure, as a solid body of Natural Philosophy, than not to do something towards the erection of it" (*Certain physiological essays and other tracts*, 1669, 18, cit. in Gaukroger 2010, 157n.).

⁸ Thus Laudan describes Locke's epistemology as that of a "life-long scientist" (Laudan 1981, 54); McCann calls the *Essay* "the first attempt ever to apply scientific method to the systematic description of the cognitive operations and abilities of the mind" (McCann 2002, 356).

⁹ Locke 1975, 7 (emphasis mine).

¹⁰ Cranston 1957/1985, 140-141; Rogers 2007, 8. The manuscript of the *Essay* with Tyrrell's marginal annotations is now in the British Museum.

mind *in order to improve our moral, social, religious and political life*.¹¹ To be clear, this is a very different picture of the *Essay* than the one which, capitalizing on the ‘Underlabourer’ motif, portrays Locke as a naturalistic thinker who seeks to transpose the success of Newtonian science into the realm of the mind. And this further indicates that Locke’s intention is not *per se* an ontology: the relevant area of inquiry for him is not the “depths of the ocean of Being” (*Essay*, I.i.7) but rather matters concerning our *conduct*: “Our Business here is not to know all things, but those which concern our Conduct” (*ibid.*, I.i.6).

On the fundamental nature of the physical world, Locke defers to Boyle’s corpuscularianism, which he thinks provides the best explanation we have (“I have here instanced in the corpuscularian Hypothesis, as that which is thought to go farthest in an intelligible Explication of the Qualities of Bodies”¹²); yet he insists on the distinction between the corpuscular world and the world of experience, stressing that the latter is the only one he cares about, in a section of the *Essay* tellingly entitled “Our faculties for discovery of the qualities and powers of substances suited to our state.”¹³ In a vivid passage, Locke asks what we would do if we had “microscopical eyes”: if “a man could penetrate further than ordinary into the secret composition and radical texture of bodies,” would this be a great advantage to him? Not if “such an acute sight would not serve to conduct him to the market and exchange; if he could not see things he was to avoid, at a convenient distance.” That is, an ability to ‘zoom in’ on the microstructure of reality would be of no practico-ethical use to us – and moreover, we would be divorced from the world of our fellow humans:

... if that most instructive of our senses, seeing, were in any man a thousand or a hundred thousand times more acute than it is by the best microscope, things several millions of times less than the smallest object of his sight now would then be visible to his naked eyes, and so he would come nearer to the discovery of the texture and motion of the minute parts of corporeal things; and in many

¹¹ Tyrrell’s account has been challenged, in a rather tortuous alternate account of the genesis of the *Essay* (Romanell 1984, esp. 148-149, and 203, n. 66). Tyrrell may have misremembered the meeting of Locke’s friends. But Romanell’s main claim – that the key issue, the “remote subject,” was medicine, which structures all of Locke’s thought – is extremely implausible, at best; his secondary claim, that Locke’s ‘historical, plain method’ derives from the idea of ‘medical histories’ (*ibid.*, 144-147, 192-203, n. 56) is at most a thin analogy or association of ideas, the evidence for which includes ‘facts’ such as Locke’s usage of the adjective ‘plain’ to describe Sydenham’s method of treating smallpox. For a more sophisticated version of the view that Locke’s empiricism is influenced by medicine, see Duchesneau 1973, 136f. Briefly, my view is that Locke devoted a number of years of his life to medicine (in different ways), and that his collaboration with Sydenham indeed reflects an emphasis on the ‘practical’ dimension; but after 1689, he ceases to care about medicine (as noted by Milton 2001, 221).

¹² Locke 1975, IV.iii.16; see also I.iii.16, ii.11.

¹³ Locke 1975, II.xxiii.26; cf. IV.iii.25, iv.10.

of them, probably get ideas of their internal constitutions: but then he would be in a quite different world from other people.¹⁴

However much Locke may think nothing is in the mind which was not first in the senses (with some caveats regarding propositions and associations that are outside the scope of this paper; he does state in II.i that we have ideas of sensation *and of reflection*), he does not think these ‘contents’ are specifiable in a quantitative science of the mind; and he does not think we have access to the essence of natural bodies (or minds). So much for Locke the ‘underlabourer’ transposing or importing Newtonian and Boylean concepts and explanations into the world of the mind and experience.

Other readings, which boldly fuse together Locke and Thomas Willis (the great neuroanatomist who was also his teacher at Oxford), and make Locke into a thinker who, using anatomical discoveries as “stepping-stones,” develops the “philosophy that would shape the Enlightenment and modern neuroscience,”¹⁵ are, in my view, *not a matter of interpretation* but are simply mistaken. Locke does not categorically rule out that knowledge of the brain might or should have an impact on knowledge of the mind (even if he seemed hostile or at least ‘not amused’ by the speculative materialism of a Toland, he was affectionately close to the equally materialist Anthony Collins¹⁶). However, he *is* explicit that his empiricist project has nothing to do with any sort of brain-mind materialism: “I shall not at present meddle with the Physical consideration of the Mind” (I.i.2); any effort to “enquire philosophically into the peculiar Constitution of Bodies” is “contrary to the Design of this Essay” (II.xxi.73). The mistaken view that Locke *does* seek to physically explain what goes on in the mind goes back as far as Kant, who claims Locke’s project is a “physiology of the understanding.”¹⁷

Granted, some exciting recent scholarship has pointed to the presence of a veiled ‘neuropsychology’ at the heart of respectable empiricism: as I mentioned earlier, John Sutton has recently given a provocative interpretation of empiricism – focusing on the discussions of sub-rational processes of association such as “fantasy” and “mind-wandering” – as on the

¹⁴ Locke 1975, II.xxiii.12, perhaps echoing Malebranche: “si nous avions les yeux faits comme des microscopes ... nous jugerions tout autrement de la grandeur des corps” (Malebranche 1979, I, vi, § 1).

¹⁵ Lega 2006, 569.

¹⁶ Collins and Locke exchanged extraordinarily passionate and moving letters filled with ‘Platonic eros’ in the last years of Locke’s life (some are cited in Wolfe 2007). But in their more ‘intellectual’ exchanges, Collins mentions Toland neutrally, and Locke responds that “though he [*sc.* Toland] has parts yet that is not all which I require in an Author I am covetous of, and expect to find satisfaction in” (Collins to Locke, Feb. 16th 1704, letter 3456 in Locke 1989, 198; Locke to Collins, Feb. 28th 1704, letter 3474 in Locke 1989, 217). Elsewhere Locke expresses dismay that Toland claims to be his friend (Barnes 1939, 183, 256).

¹⁷ Kant 1997, Preface to 1781 edition (‘A edition’), A ix.

contrary suffused with spirits, fancy, brain traces and other materialities.¹⁸ He points to an under-studied aspect of Locke's chapter on association (added in the 4th edition of the *Essay*), where contrary to the prohibitions stated above, Locke allows that "Custom settles habits of Thinking in the Understanding, as well as . . . of Motions in the Body; *all which seems to be but Trains of Motions in the Animal Spirits*, which once set a-going continue on in the same steps they have been used to . . ." (Locke 1975, II.xxxiii.6).

But this does not make Lockean empiricism *into* a science, nor does it make it a handmaiden, facilitator or *valet de chambre* for an 'empirical' scientific project, an *ancilla scientiae* (I deliberately use these expressions as echoes of Kant's 'handmaiden' and Locke's "underlabourer" who "clear[s] the ground a little"¹⁹); if Locke *were* the underlabourer of science this would make for a smooth transition to materialism, e.g. as a 'science of the mind' as carried out in part by post-Lockeans such as Hartley and Priestley. Nor does it make Locke a materialist, for claims about the nature of matter and mind are distinct from the specifically empiricist claim, *nihil est in intellectu quod non fuerit in sensu*. At the same time, as is apparent in the reception of Locke on 'thinking matter' from Voltaire onwards, and as has been argued on internal conceptual grounds by Nicholas Jolley and others, there is a sense in which Locke provides crucial intellectual tools and materials – weapons, some might say – to the materialist. Locke has a concept of thinking matter, or to be precise, of its *possibility*, yet this concept is not meant to empirically link the cognitive realm to the physical or biological realms. It is in this sense that, as John Yolton nicely observed, "British thinking matter is not the same as French *matière pensante*"²⁰: because the latter – in La Mettrie and Diderot, but also in earlier clandestine texts such as *L'âme matérielle* (approx. 1725-1730) – is understood as a component in a series of empirical evidence claims including the broader investigations of sensibility as a property of matter, organic sensitivity, and the recognition of the relative dependence of our cognition on our cerebral states.

In the next section, I shall briefly reconstruct Locke's articulation of the possibility of thinking matter, and how it leaves open, more or less deliberately, a materialist appropriation of the empiricist credo (the *nihil est*).

¹⁸ Sutton 2010, and already Sutton 1998, chapters 5 and 7, on tensions Locke notes between his account of personal identity and his neurophysiology of animal spirits; chapter 7 makes Locke a kind of possible neurophysiologist. See Wright 1987 for earlier hints on the importance and 'anomalousness' of Locke's discussion of association.

¹⁹ Kant speaks rather sarcastically of philosophy as the presumed 'handmaiden' (*Magd*) of theology in the *Conflict of the Faculties* and the essay on *Perpetual Peace* (Kant 1900, VII, 28; VIII, 369); thanks to Cédric Eyssette for these references. For the underlabourer reference, see Locke 1975, 9.

²⁰ Yolton 1991, 194.

2. Thinking matter, not materialism

Locke's project in the *Essay* is not to serve as a philosophical facilitator for the march of experimental natural science; nor is it a materialist project. He wishes to get some distance on the understanding and take it as an object of inquiry (I.i.1), but without looking into its "physical" underpinnings. Locke cleverly puts back to back traditional metaphysics (considerations "wherein its Essence [*sc.* the mind] consists," I.i.2) and the danger of Hobbesian inert materialism ("to resolve all into the accidental unguided motions of blind matter, or into thought depending on unguided motions of blind matter, is the same thing," IV.x.17). Locke is not a metaphysician of essence nor a corpuscular reductionist per se; the elementary level he wishes to focus on is that of *ideas*.

So how does he get to thinking matter? There are two kinds of beings, thinking and material beings (IV.x.9). If motion exists in matter, it must come from elsewhere. And even if motion and matter were eternal, they could never produce *thought* (something Toland explicitly claims): "matter, incogitative matter and motion, whatever changes it might produce of figure and bulk, could never produce thought: knowledge will still be as far beyond the power of motion and matter to produce, as matter is beyond the power of nothing or nonentity to produce" (IV.x.10). However, in the central passage on the topic (IV.iii.6), which led to many (sometimes fruitful) misunderstandings in the eighteenth century, Locke notes that on the one hand, "we have the ideas of *matter* and *thinking*, but possibly shall never know whether any mere material being thinks or no" (we have no access to essences); but on the other hand, it is impossible for us, by self-contemplation and without revelation, to know if God "has not given to some systems of matter, fitly disposed, a power to perceive and think, or else joined and fixed to matter, so disposed, a thinking immaterial substance." We don't know the limits of God's power, and he could very well "superadd" the power of thinking to matter.

Locke doesn't assert that matter can think; he asserts that *no contradiction is implied in thinking so*.²¹ Indeed, he thinks that the "more probable Opinion" is that thought is "annexed" to an immaterial substance.²² However, as Jolley and Parmentier have argued (and

²¹ This formulation is Thiel's (Thiel 1998, 61), who also notes that one has to consider Locke's agnosticism about thinking matter in relation to his discussion of personal identity, which is both a denial of Cartesian 'thinking substance' and at the same time a non-materialist theory. See also Hamou 2004.

²² Locke 1975, II.xxvii.25.

as some apologeticists claimed already in the eighteenth century), by weakening a certain Cartesian version of theological orthodoxy *in the name of another theologically grounded position* (God can superadd x to y ...), Locke facilitates the transition to materialism. Parmentier suggests convincingly²³ that a consequence of the destruction of the traditional notion of substance in the *Essay* is the impossibility of any refutation of materialism (even though pro forma, it looks like he has dispatched both forms of ‘substantialism’, ideal and material). As the conservative polemist A.-M. Roche put it in 1759: Locke declared himself “if not in favor of materialism, then at least of its possibility,”²⁴ although another apologeticist, the Abbé Pluquet, thought it was an “injustice to include Locke among the Materialists or the Fatalists.”²⁵

Yet from the perspective of our story, thinking matter is not a naturalistic concept that opens onto a comparative, anatomico-functional or physiological study of brain and mind, whether historically (this metaphysical problem was unnecessary or superfluous in the development of such ‘neuropsychological’ investigations) or philosophically (Locke rules it out).²⁶ In that sense, Hartley and Priestley in England, or Le Camus and Cabanis in France do not extend Locke’s project in a linear fashion, like cutting along dotted lines; non-naturalistic investigations of the mind like, say, Thomas Reid’s are just as much the unfolding of a Lockean study of the ‘understanding’. Similarly, there is no direct progression in the history of science from Lockean empiricism or forms of eighteenth-century materialism to the emergence of psychology as a scientific discipline in the nineteenth century, not least since most treatises of Psychology or Faculties of the mind (Wolff, Reid) were not materialist.²⁷

But Locke’s argument that God could have superadded the power to think to matter was indeed taken up in the clandestine, materialist literature (for instance in *L’âme matérielle*) in a *realist* interpretation, in which thought is a *property* of matter. And Voltaire, who is probably the main figure responsible for this materialist reading of Locke’s concept – making

²³ Parmentier 2002, 62.

²⁴ Roche 1759, I, 85. A similar point is made, more aggressively, in the anonymous review of the French translation of the *Essay* in the Jesuit *Journal de Trévoux* (janvier 1701, 128).

²⁵ Pluquet 1757, vol. 2, 457.

²⁶ John P. Wright notes, however, the influence on Locke of Thomas Willis’s Oxford lectures on the soul, and observes that Willis uses the language of fitly disposed systems of matter (Wright 1991, 254). However, Wright adds, consonant with the present essay, that one should not confuse Willis’s more ‘Epicurean’ project to naturalize the soul (cf. Wolfe and van Esveld, forthcoming) with Locke’s rejection of ‘physical considerations of the mind’ (Wright 1991, 255-256).

²⁷ Schneewind 2006. There are obviously other trajectories from Lockean empiricism onwards – towards Hume and Mill, or Scottish moral psychology, or Jonathan Edwards on the will; to Kant, and Friedrich Lange’s *History of Materialism* – but the one towards materialism, which I have focused on here, is not studied so much, except for the work of Udo Thiel.

Locke a “matérialiste malgré lui,” in Paul Hazard’s terms²⁸ – associates him positively with Toland and Collins (and Hobbes and Spinoza!), in the thirteenth of his *Lettres philosophiques* or *Lettres anglaises*.²⁹ Diderot, who rather disingenuously ends the article “Locke” in the *Encyclopédie* by asking, “what difference does it make if matter thinks or not?”³⁰, in fact takes as his *cheval de bataille*, at the beginning of *Le Rêve de D’Alembert* and elsewhere, that matter, *all of matter*, can sense and thereby think.

So far, I have left unstated a fairly obvious missing link between the *nihil est* and thinking matter: even if Locke himself tries to ‘head off’ this way of understanding them, both doctrines immediately seem to open onto or be accessible to, a naturalistic appropriation, whether in the direction of philosophical materialism, a specifically medical empiricism, or ‘scientific’ projects such as Hartley’s ‘Newtonian neuropsychology’ (Smith 1987). Indeed, at that point they would seem to intersect, since if thinking is material, the empiricist credo plays an obvious role, and if our cognitive configuration can be studied by psychologists of perception, the cerebral and material dimensions are not far off. And this is not just conjecture or thought-experiment: the Paris physician Antoine Le Camus, in his 1753 *Médecine de l’Esprit*, praises Locke by name, calling him the “Chef des Philosophes” (and a few pages later gives his version of the *nihil est*: “connaître, c’est sentir”) but then immediately deplores that Locke left out all the anatomical and physiological detail of how the senses work, which he claims he will provide.³¹ After all, Locke had been a physician, working with Sydenham and earlier, studying with Willis (who is sometimes presented as the source for Locke’s anti-innatism). Clearly, in our project of ‘reconstruction and delineation’ of empiricism and its ontologization, we need to devote more attention to the medical dimension of its core claim.

3. *Nihil est in intellectu quod non fuerit in sensu*, from medicine to materialism

²⁸ Hazard 1935/1963, 231.

²⁹ The list also includes Montaigne, Bayle, and Shaftesbury. Voltaire’s text was originally published as *Letters concerning the English Nation* in London in 1733, and in French as *Lettres écrites de Londres sur les Anglois ...* (Paris, 1734), translated by Voltaire himself into English as *Letters on the English* in 1778, before his death; but there is some controversy as to whether the original was written in English first (Cronk 2001). D’Alembert’s “Discours préliminaire” in the *Encyclopédie* and Condillac’s work play a key role in the more specifically sensationist development.

³⁰ Diderot 1765a, 627a.

³¹ Le Camus 1753, chapter 1 (“Logique des Médecins”), § 1, 13. For another instance of a physician trying to give medical-materialist underpinnings to sensationist epistemology, see Maubec 1709 – which has the *nihil est* phrase as its subtitle.

Other than ‘empiricism’, Anglophone philosophical language has another term for the philosophical position according to which all our knowledge comes from the senses, and a rather awkward one: ‘sensationism’, as opposed to other languages which opt for versions of ‘sensualism’. The latter term in English has the drawback of being associated with a certain kind of lifestyle (one catering to the pleasures of the senses) but, just as ‘hedonism’ is both a term in everyday language and, differently, a term in moral philosophy, it should be possible to reappropriate ‘sensualism’ to mean the philosophical position discussed here. In fact, there is a history of these words and their entry into the language. The nineteenth-century literary Sainte-Beuve explained that the French language refers to the doctrine as ‘sensualisme’ because of Victor Cousin:

Mr Cousin, in order to refer to the rival school in the eighteenth century, which tied ideas to sensations, called it the sensualist school. To be precise, he should have said ‘sensationist’. The word ‘sensualist’ naturally calls up the idea of a practical materialism which is helpless faced with the pleasures of the senses ... and nothing is less true of Condillac ... But it is always a good idea to cast scorn on one’s opponent in passing, for something of it will remain.³²

If what Sainte-Beuve said of Cousin is true, the pejorative meaning of the word was used to try and discredit the philosophical meaning (not an uncommon strategy, if one thinks of judgments found in older secondary sources and textbooks, such as this comment on Diderot in the standard French high school literature textbook: “très matériel, il semble avoir été prédisposé au matérialisme...”³³). As late as 1978, Pucelle, the translator into French of Locke’s 1693 essay *Of seeing all things in God*, says that Locke does not *just* assert a “sordide empirisme au rabais”: a “sleazy, down-market empiricism...”³⁴ Sensualism and empiricism are not so distant from one another, then, given this kind of suspicion; and materialism is never very far off.

As I suggested above, the key development here is the gradual ‘ontologization’ of a claim about sensation and knowledge – *nihil est in intellectu quod non fuerit in sensu*, variously rendered – so that it becomes a core component of materialist philosophy, particularly regarding the brain-mind relation. But this was not a self-evident relation, and it is important to see how a process of ‘importation’ and transformation was involved. That the claim ‘nothing is in the mind which was not first in the senses’ was also a *medical* claim is

³² Sainte-Beuve 1988, “Notes et pensées,” § cxvi, 211. For more on ‘sensualisme’ as equivalent to ‘empirisme’ in nineteenth-century thinkers such as Joseph-Marie Degérando, see Daled 2005.

³³ Lagarde & Michard 1960, IV, 196. It is difficult to render ‘matériel’ in English, but the implication is that Diderot’s philosophical inclination towards materialism was itself due to his coarse, physical, bodily nature ...

³⁴ Pucelle, in Locke 1978, 25.

part of this process of back-and-forth of naturalistic discourse, as it moves between theoretical reflections inspired by empirical practice (recall that ‘empiricism’ itself is a term loaded with a medical background, from Galen’s *empirikoi* to early modern ‘empiricks’³⁵) and more properly philosophical reflections, whether Lockean or materialist.

Different versions of the *nihil est* claim circulate between various kinds of texts: philosophical, medical and hybrid theoretical texts seeking to capitalize on medical authority (as in Guillaume Lamy and La Mettrie; see Wolfe 2009). One can see this as a particular case of the general theme that sensibility and the sensorium were ‘biological’ ideas in the eighteenth century, or that for the eighteenth-century “discourse of sensibility,” “the master discourse was medicine.”³⁶ That is, while various glosses on the phrase are found in philosophical texts, it is also frequently appealed to in medical texts, sometimes in tandem with more traditional appeals to experience and/or experiment.

Of the former, some we would label ‘empiricist’ (Hobbes: “there is nothing in the human intellect that was not previously in sense (for sensation takes place through the action of objects even . . . upon the sensoria or the organs of perception)” or Locke: “There appear not to be any ideas in the mind before the senses have conveyed any in”³⁷; Diderot repeats different versions of it throughout his work, once crediting Hobbes with the idea³⁸), others not (Montaigne: “all knowledge is conveyed to us by the senses; they are our masters”; “He that could make me contradict the senses would have to take me by the throat. He could not drive me back further from the truth. The senses are the beginning and the end of human knowledge”³⁹).

As to the latter, some physicians just speak of ‘empirici’ or praise ‘experience’,⁴⁰ whereas others explicitly use the *nihil est* phrase, including Fallopius, whose praise of

³⁵ On ancient medical empiricism, see Hankinson 1995; on early modern medical ‘empiricks’, Hambridge 1982 and more broadly, Cranefield 1970, Wolfe 2010.

³⁶ Respectively, Figlio 1975, 200 and Lloyd (forthcoming).

³⁷ Hobbes 1976, ch. XXX, § 3, 364 / 349; Locke 1975, II.i.23. A much more familiar and explicit version is in Leibniz, negatively put of course: *Discours de métaphysique* § 27, and *Nouveaux Essais* II.i.8. Locke probably takes it from Gassendi; it’s also in Bayle 1731, IV, 481-482 (he calls it “vulgar”).

³⁸ Diderot analyses the phrase at length in the *Suite de l’apologie de Prades* (Diderot 1975-, IV, 326-334, 352-354); aside from the other texts cited, it also occurs in the *Paradoxe sur le comédien* (Diderot 1975-, XX, 85), in the *Réfutation d’Helvétius* (II, i, in Diderot 1975-, XXIV, 514-515, where he credits the phrase to Hobbes), the article “Évidence” (attributed to Quesnay), *Enc.* VI, 148, 261 (and the articles “Encyclopédie” and “Inné”); cf. Proust 1995, 268f. La Mettrie’s shorthand version, at the end of the *Histoire naturelle de l’âme*, is “no senses, no ideas.”

³⁹ Montaigne 1992, II, 587f. (commenting on Lucretius).

⁴⁰ Respectively, della Croce 1583, A2v (“ma a questi tempi posta talmente al basso, che gli empirici, cioè quel li, che usano il solo isperimento la esercitano”) and Fioravanti 1582, I, i, 4. Fallopius concludes his discussion of the controversies on the treatment of the plague by siding with the ‘empiricks’ (“sum cum Empyricis”):

anatomy emphasizes that therein, “nothing comes to be secured except by what is clear by means of sensation,”⁴¹ and Willis, for whom “All Knowledge is made by the Sense.”⁴² Maubec, in Chapter IV of his work on mental faculties and the brain, explicitly connects both of these empiricist motifs, ironically right after favorably discussing animal spirits (not the most experimentally or experientially confirmed entity): he will not assert “anything that is not confirmed by experience or self-evident,” and *by following this method*, he will show that “all of our knowledge comes from sense-impressions.” Maubec extends this issue in later chapters (V-VI), describing how in the course of development, sense-impressions imprint themselves on the child’s brain as if on a piece of wax. Harvey integrates the phrase into a methodological statement on natural philosophy: “If faith through sense were not extremely sure, and stabilized by reasoning (as geometers are wont to find in their constructions), we should certainly admit no science: for geometry is a reasonable demonstration about sensibles from non-sensibles.”⁴³ From the sixteenth century (Fallopian) to the seventeenth (Willis and Harvey) and onto the eighteenth (Mandeville, Le Camus, Ménéuret) and nineteenth centuries (Cabanis), the *nihil est* principle, sometimes presented as an ‘axiom’, is actively employed in medical texts.

It is in fact an old claim – often attributed to Aristotle, who doesn’t say anything of the sort, but in Scholasticism it ‘settles’ as an established claim, perhaps inspired by passages in the *Posterior Analytics* and the *Nicomachean Ethics*.⁴⁴ For almost all fourteenth- and fifteenth-century Aristotelians, sensation was the foundation of cognition, a truth which they summarised in the *nihil est* formula; Pico uses it to sum up Aristotle’s position.⁴⁵ As late as the 1790s, Condorcet gives the *nihil est* ‘top billing’ (in capitals), and identifies its source as Aristotle: “our most abstract or intellectual ideas originate in our sensations.”⁴⁶ That knowledge came from the senses was not viewed as an especially scandalous claim prior to

Tractatus de bubone pestilenti, “De pharmaci exhibitione quaestio,” in Fallopius 1566, 12r. Thanks to Cindy Klestinec and Craig Martin for these references (della Croce, Fioravanti; Fallopius, respectively).

⁴¹ Fallopius, *Expositio de Ossibus*, III, in Fallopius 1584, 521 (thanks to Benny Goldberg here).

⁴² Willis 1683 = *Two Discourses*, ch. X, 5. Mandeville also approvingly discusses the *nihil est* principle – here, that our knowledge of natural things comes from the senses – and credits Sylvius as the source (Mandeville 1730/1976, vi), but the idea is clearly being put to more *philosophical* use.

⁴³ Harvey 1628, in Harvey 1976, 55.

⁴⁴ *An. Post.* II, 19; *Eth. Nic.* VI, iii, 3. Hegel himself notes that it is a mistake, originating in Scholasticism, e.g. Aquinas (or even earlier, Bonaventure; one could add Henry of Ghent) to attribute the ‘nihil est’ phrase to Aristotle, and suggests (à la Leibniz) that both this claim *and the converse* (“*nihil est in sensu quod non fuerit in intellectu*”) are true (Hegel 1830/1959, § 8a).

⁴⁵ Park 1988, 470; Charles B. Schmitt, cit in Cranefield 1970, 78.

⁴⁶ Condorcet, *Esquisse d’un tableau historique des progrès de l’esprit humain* (1795), 5th époque, in Condorcet 1847-1849, VI, 88.

the early modern era: Fontenelle suggests that “the ancient philosophy was not always mistaken,”⁴⁷ possibly glossing on Régis’ “Let’s conclude that the ancient philosophers were right to say there is nothing in the understanding that did not pass through the senses,”⁴⁸ which is repeated in various clandestine manuscripts.⁴⁹ Sometimes, the *nihil est* is presented as true because Aristotle himself held the view (even if that was not quite correct); sometimes, it is a radically *new* claim in the sense that a degree of antiquarianism either masks its novelty or is intended to combat a mainstream view of the time. Diderot describes Locke, in the *Encyclopédie* article of that title, as the thinker who “renewed the ancient axiom” of empiricism, and in the earlier *Suite de l’Apologie de l’Abbé de Prades*, he also calls it an axiom, but mentions the ‘antiquity’ of the idea to defend it against charges of impiety.⁵⁰

The medical dimension of the *nihil est* is significant, yet ambiguous, as it does *not* entitle us to view empiricism as, say, the philosophical outgrowth of an experimental practice (here, medicine, contrary e.g. to Romanell’s claims about medicine as the basis for Locke’s empiricism), and further, it does not directly contribute to the naturalization *cum* ontologization of the claim: when Hartley, Cabanis, or differently Madame de Staël say that “nothing is in the mind that was not first in the senses” implies, leads to, or is interdependent with the claim that “mental processes are cerebral processes” or that thought is “just a material product of the brain,” they are not appealing to a particularly *medical* prestige or ‘force of conviction’. Indeed, this medical dimension, including Willis’ influence on Locke, makes it curious that Locke presents his version of the *nihil est* in non-materialist terms (“I shall not meddle with...”). And sure enough, quite soon after Locke, from Maubec’s rough attempt to create a physiology for each mental faculty to Le Camus’ praise for Locke as a precursor of a ‘*medicina mentis*’, a medicalized version of an empiricist picture of the mind emerges which seeks to compensate for this lack. At the end of the eighteenth century, Cabanis – a self-proclaimed *médecin-philosophe* – discussed Locke and Condillac’s doctrines of sensation and commented that they were only lacking a proper study of the structures and functions that subtend the senses – basically, the brain.⁵¹

⁴⁷ *Fragments de la connaissance de l’esprit humain*, in Fontenelle 1818, II, 411.

⁴⁸ Régis 1704, 108 (cf. Niderst, ed., 2003, 224 n. 1).

⁴⁹ *Symbolum Sapientiae* (Chapter III) and *L’Âme matérielle*, 2003, 224; Fréret 1768/1986, 329-330 (a kind of ‘digest’ of Locke, Collins and Montaigne), and D’Argens 1737.

⁵⁰ Diderot 1765a, 626b; Diderot 1975-, IV, § 12, § 5.

⁵¹ Cabanis 1802/1956, vol. 1, 141, 165, 196, etc. From the Preface onwards, Cabanis praises Locke for moving the study of man away from metaphysical hypotheses, bringing together “l’homme moral” and “l’homme physique,” but he judges that Locke did not carry this project far enough.

The idea of a ‘medicine of the mind’, from the standpoint of the history of science, appears like a ‘predecessor’ if not precursor of psychiatry (Rey 2000); from the standpoint of empiricism, it seems to be a deliberate attempt to set it on a scientific (here, medico-physiological) footing. In that sense, the mistaken view that Locke is a facilitator of neuroscience is not strictly a contemporary scholarly mistake: just as some physicians (but also Hartley) sought to fill out the physiological blanks in the empiricist story of the mind, and some materialists sought to appropriate it, some ‘period actors’ felt that empiricism led directly to the horrid consequences of materialism: Madame de Staël explicitly says that the “repellent view“ according to which thought is “just a material product of the brain,” is “the most natural result” of tracing all of our ideas back to our sensations.⁵²

Now, these are quite distinct claims which are combined in materialism: (i) *ideas come from the senses*; (ii) *the senses require a brain*; therefore (i’) *ideas (and thought) require the brain*, and indeed occur in the brain (although very few thinkers explicitly make this equation); therefore (ii’) *knowledge about the brain should shed light on ideas and what knowledge is per se*. That these claims can remain distinct, and be pursued independently of one another helps explain the otherwise surprising fact that Locke and especially materialists such as his beloved disciple Collins not only provide *no naturalistic* grounding or ramifications of their account of the mind and ideas, but they go out of their way to *not* provide them. Here, partisans of ‘left-wing Cartesianism’ (Vartanian 1953) would say that Cartesian mechanistic physiology, particularly neurophysiology, play a key role; but in fact, neither Lockean empiricism nor Cartesian physiology are as directly involved as reprisals of seventeenth-century debates on animal minds (confirming the danger Bayle warned against, of allowing for animal souls⁵³), comparative anatomy, and animal spirits (Lamy, *L’âme matérielle*). Instead, it was typically *opponents* of such views (both ‘empiricist’ views on the origin of ideas and ‘materialist’ discussions of thought and the brain which included ‘empirical’ scientific elements such as descriptions of the functioning of poisons or mental illness) who explicitly connected them in a coherent whole: Clarke and Cudworth in the seventeenth century, and Samuel Formey, Abraham Chaumeix and the Abbé Pluquet in the eighteenth century.

The ontologization of the *nihil est* claim is both a *philosophical-materialist* move (from Condillac to Diderot especially) and a *scientific* move (Hartley, Le Camus, discussions

⁵² de Staël 1820, IX, 148.

⁵³ Bayle, “Rorarius,” in Bayle 1697/1740, IV.

of animal spirits and other ‘organic’ accounts of sensation and cognition). But these can be quite separate, as in Charles Bonnet, who maintains a kind of functional or property dualism, and wavers on materialism as an ultimate explanatory principle, granting that “all the ideas affecting the soul at the same time, do not affect it with an equal vivacity. This variety in impression[s] stems mainly from the greater or less intensity of the movements communicated to the fibres of the brain,” and in a later work that “the vivacity of sensations is necessarily proportional to the intensity of the movements that excite them.”⁵⁴ But the more thinkers like La Mettrie and Diderot put their own stamp on the *nihil est* claim, the more it gets ontologized: “sensations cannot deceive us.”⁵⁵

4. The ontologization of empiricism: brain, body and sensation

We can also see the different ways in which the empiricist credo *nihil est...* gets ontologized and naturalized so that it becomes a materialist ‘axiom’, not as materialist versus scientific developments, but as different empirical-functional emphases. That is, this ontologization could increasingly emphasize (a) the specific role of the *brain*, (b) the *embodied*, generally *biological* character of sensation and by extension, (c) its ‘*objectivity*’.

(a) As I have mentioned, and as would seem obvious to a twentieth-century philosopher of mind or *a fortiori* of neuroscience, it can seem surprising that these empiricist theories seem to deliberately bracket off any consideration of the brain (and the issue is not a lack of empirical or experimental ‘acquaintance’ with neuroanatomy or neurophysiology), contrary to Kant’s rather knee-jerk claim that Locke attempted a “physiology of the understanding.” But starting in the early 1700s, some exceptions can be detected.

A rather unique case is John Toland, who explicitly combines the claims I distinguished above (ideas come from the senses, which themselves require a brain, hence mental processes are brain processes, to put it in ‘identity theory’ terms):

Whatever be the Principle of Thinking in Animals, yet it cannot be perform’d but by the means of the Brain. We Men are conscious of no Thoughts, while the Functions of the Brain are suspended; . . . and we observe no signs of Thought in any things that want a Brain, whereas every Creature that has one, seems to show some degree of Thinking by its Actions.⁵⁶

⁵⁴ Bonnet 1771-1783, vol. 17, 16; vol. 13, 122.

⁵⁵ *Discours sur le bonheur*, in La Mettrie 1987, II, 246.

⁵⁶ Toland 1704, IV, § 7, 139. Further, thinking can only occur where matter is organized into “a Brain” (*ibid.*).

David Hartley's theory has both a general materialist outlook ("By the mechanism of human actions I mean, that each action *results from the previous circumstances of body and mind*, . . . as other effects do from their mechanical causes"⁵⁷) and a specifically 'vibratory' materialist account of mind: small vibrations ("vibrunticles") are impressed in the solid filaments of the nerves by external objects; these sensations are transmitted by ætherial vibration to the infinitesimal particles that make up the substance of the brain. By their differences in degree, kind and place, these vibrations represent different primary sensations, or "simple ideas" in the brain, which can become complex ideas through associations with other chains of vibrations.⁵⁸ Hartley also tried to avoid ideological difficulties by differentiating 'empirical science' from materialism: "I do not, by ascribing the performance of sensation to vibrations excited in the medullary substance, in the least presume to assert, or intimate, that Matter can be endowed with the power of sensation."⁵⁹

Anthony Collins nudges Locke's caution towards a kind of materialist boldness – but not by focusing on the *nihil est* credo; instead, he turns back to thinking matter. Collins' contributions to his debate with Samuel Clarke on matter and thought (1707-1708) were almost entirely a radicalization of Locke's thoughts on thinking matter; he even remarked that Locke did not want to move "too far from the Notions on which the Philosophy now in the World is built," implying that he, Collins, was willing to move further away from such notions – having declared earlier on in the same work that "all this talk of the essences of things being unknown is a perfect mistake."⁶⁰ For Collins, "human consciousness or thinking is a mode of some generical power in matter," yet he refused to have his view collapsed, as Clarke tried to, into Hobbes' view that thinking is *just* motion, plain and simple.⁶¹ Even if Collins did not produce a materialist theory of mind in a particularly *biological* sense, he gave a fully materialistic definition of the relation between thought and external objects: thinking is like a windmill which only turns when wind blows, in the sense that thinking can only exist when it is excited by the impression of external objects, since our ideas are at first ideas of sensation:

⁵⁷ Hartley 1749, I, 500.

⁵⁸ *Ibid.*, I, 13-16.

⁵⁹ *Ibid.*, I, 33.

⁶⁰ Collins 1708, 92 / in Clarke 1738, vol. 3, 884; *ibid.*, 83 / 881.

⁶¹ Collins 1707, in Clarke 1738, vol. 3, 807; Clarke's 1708 reply, in *op. cit.*, 836-837, 851. Collins added in the next essay (Collins 1708) that both thinking and matter have modes, e.g. willing is a mode of thinking (in Clarke 1738, vol. 3, 864).

If we think on the simple Ideas of Sensation, it is matter of Fact, that we do not begin to think upon them till Bodies operate upon us. And this is an evident Agreement of Human Thinking with a Power or Affection of Matter, which ever owes its Existence to the Motion or Operation of some other Body.⁶²

Yet Collins' account of the mind is at the very least a *non-reductive* naturalism, since he never seeks to do away with 'folk psychology' by appealing to a more 'scientific' account of perception, physiology, matter, or causation; his approach is much more skeptical, reflecting his preference for Cicero, and perhaps more relevantly, Montaigne and Bayle (Collins 1717, 8). And, as has been observed, he does not appeal to scientific information in his work⁶³; this matches up with Ayers' judgment that early modern empiricism is "notoriously weak in its philosophy of experiment,"⁶⁴ contrasting with twentieth-century forms of empiricism, which are heavily science-focused (Nagel 2006).

There is a distinct sense in which Toland and Collins are doing metaphysics or conceptual analysis (respectively), rather than engaging, as Diderot will, in a naturalistic project of extending empiricism by integrating information – or theories, or speculations – on the actual 'wetware' of mind, brain and body, although Collins' materialist account of mind does have a componential dimension. A more 'embodied' emphasis on 'wetware' is visible if we turn our attention to developments on the other side of the Channel, in the next decades of the eighteenth century.

(b) Condillac takes from Locke in particular the core idea that there is nothing in the understanding that was not first in the senses (influencing even Jean Itard in his work with the original 'wild child', Victor de l'Aveyron, which Itard presented as anti-innatism in practice⁶⁵), but he innovates by exploring its implications and beyond, with his celebrated thought-experiment of the statue, in the 1754 *Traité des sensations*, which builds on the 1746 *Essai sur l'origine des connaissances*. In this thought-experiment, Condillac suggests we

⁶² Collins 1708, in Clarke 1738, vol. 3, 863.

⁶³ O'Higgins 1970 makes much out of the comparative 'absence' of scientific works in Collins' library ("of all the seventeenth century influences working towards rationalism, he seems least to have been affected by that of physical science," 43). This is mistaken at least in terms of Collins' readings, but the absence of scientific examples in his work is nonetheless noteworthy.

⁶⁴ Ayers 1991, vol. 2, 159.

⁶⁵ As Cranefield notes in his short history of the *nihil est* formula, Condillac's elaboration of Locke's *sensualisme* influenced Itard, who spoke of Locke and Condillac's value for "medical education": "On doit aux travaux de Locke et de Condillac, d'avoir apprécié l'influence puissante qu'a sur la formation et le développement de nos idées, l'action isolée et simultanée de nos sens. C'est d'après ces principes que lorsque j'eus rempli les vues principales que je m'étais d'abord proposées, et que j'ai exposées dans mon premier ouvrage, je mis tous mes soins à exercer et à développer séparément les organes des sens du jeune Victor" (Itard 1806, "Développement du fonctionnement des sens," § I, in Itard 1994, 66).

imagine we are purifying a being (the ‘statue’) of all data except those which it receives through the senses, which amounts to conceiving of an animate being as a *sensorium*. The capacity to sense is assumed as basic. It is hard to find a contemporary way of describing the purpose of the statue experiment: it is a kind of reconstructive cognitive psychology, but also ‘revisionary’ (as opposed to descriptive) since it is an attempt to rebuild a thinking, sensing person from the ground up. Once we have endowed the statue with the five senses (or rather recomposed them in combinatory fashion: smell, hearing, taste, sight, touch in that order), “we witnessed the statue become an animal concerned with its own self-preservation.”⁶⁶ Nature does not grant the mind all of its faculties outright; rather, it endows us with organs by means of which we sense pleasure and pain, and hence learn through experience. The more the statue or rather its senses evolves, in what we would today call intermodality (e.g. as touch progresses, the data the statue obtains therein impact the evolution of other senses), the more it moves from passivity to activity: “even though our sensations are passive, it does not follow that everything that comes from sensations is also passive.”⁶⁷

Neither Locke nor Condillac have a vision of the mind as inherently passive, as is often claimed in rather caricatural portrayals of empiricism, such as Charles Taylor’s, for whom empiricists hold that “perception is passive, and/or experience is the effect produced by external reality on the mind or ‘receptors’.”⁶⁸ (This view may exist, e.g. in the twentieth century, but neither Locke, nor Hume, Condillac or comparable figures hold it.) Indeed, this non-passivity is yet more pronounced in Condillac, since one of the ways he distinguishes himself from Locke is by treating language as prior to sensation, and thus moving further away from a *tabula rasa* vision of the mind. He also pays greater attention to the role of abstraction and synthesis, and, reflecting his interest in the autonomy of language, writes that signs “free” the mind from its spatiotemporal constraints: “before the usage of arbitrary signs, the operations of the mind are not free.”⁶⁹

In a way that is only fully articulated in a more materialist context (from clandestine authors to known figures such as La Mettrie and Diderot), Condillac’s thought-experiment not

⁶⁶ *Traité des sensations*, “Dessein de cet ouvrage,” in Condillac 1947, I, 222. Du Bois-Reymond 1872, 462-463 has a version of the statue thought-experiment, discussing Leibniz and focusing less on the construction of a being with five senses, and more on its possession of personal identity.

⁶⁷ Condillac, 1779 letter to Count Potocki, in Condillac 1948, II, 553. In the preface (“Dessein de cet ouvrage”) to his 1754 *Traité des sensations*, Condillac notes that in the *Essai* he had not yet accepted the idea of this intermodality – that different senses could “educate” one another, in his parlance.

⁶⁸ Taylor 1964, 92.

⁶⁹ To Gabriel Cramer, in Condillac 1953, 83. He also wrestles with (and innovates with respect to) the dual conceptions of Locke and Port-Royal Logic, asserting that grammar and logic are one and the same.

only extends a Lockean epistemological project but also ‘biologizes’ Locke’s vision of ideas. Condillac himself hints at a more physiological treatment of ideas than Locke’s, e.g., in the chapter on organic sensitivity in his 1780 *Logique*, where he asserts that sensitivity is caused by the communication between sense organs and the brain, and (in this close to Diderot) that all of our senses reduce to that of touch. This kind of emphasis is more marked in authors such as Diderot and d’Holbach (and earlier, in a more Epicurean vein, La Mettrie and the anonymous *L’âme matérielle*). For d’Holbach, “to be what we call intelligent, one must have ideas, thoughts, volitions; one must have organs; to have organs, one must have a body,” an insight he extends to include the *chasse gardée* of first-personhood, my own self-consciousness: “I can only be aware or assured of my own existence by the motions I experience in myself.”⁷⁰ The distinctly embodied-materialist flavour of *L’âme matérielle* turns this into a kind of constructed neuroscience: “The sense organs truly act on the animal spirits. . . they push them into certain little canals rather than others. . . . Our sensory network must then be considered as material or, which amounts to the same thing, as a mechanical action of the sense organs on the animal spirits.”⁷¹

We should distinguish between two distinct claims, the first of which is independent of the second:

1. All of our thoughts come from our sensations
2. Our body, which is the material basis of our sensations (and our capacity to sense), whether this is specified in cerebral or more organismic terms, as a body-brain network, is the *cause* of our thoughts.

The shift from 1 to 2 can be seen if we contrast all the earlier variations on the *nihil est* with Diderot or d’Holbach’s statements above. Indeed, even though Locke was attacked by some theologians (from Stillingfleet to the Kortholts), Jansenist opponents of the *Encyclopédie* such as Abraham-Joseph Chaumeix clearly noted that Diderot forced Locke’s claim 1 into his own claim 2.⁷² In other words, claim 1 on its own is not necessarily a problem. The question *philosophy* has to answer, as D’Alembert suggests, is then: how do sensations produce ideas?⁷³ There are multiple possible answers, or even routes *to* and criteria *for* an answer here, but we can isolate two, both of which are materialist: an expansion of the thinking matter

⁷⁰ D’Holbach 1772/1971, § 46, 36-37; § 41, 30.

⁷¹ *L’âme matérielle*, 2003, 230.

⁷² Chaumeix 1758-1759, I, 238, versus, say, Formey, who is more Cartesian in his anti-sensualism, asserting the self-transparency of the mind, over and against the confusion of bodies and senses (Formey 1747, § LXXXV).

⁷³ D’Alembert 1759/1986, ch. VI, “Métaphysique,” 39.

claim, and the recognition that a full account of sensation and cognition will have to include the *brain* (as Toland and Collins saw, and as Diderot extended in a much more naturalistic, empirical direction).

Contrary to the above trend, the Abbé de Condillac, who was the Royal Censor after all, was not a materialist; he disliked Spinozist determinism and Spinoza's pronounced causal metaphysics,⁷⁴ and also steered clear of the 'French' reading of Lockean thinking matter – arguing in a way reminiscent of Hume's 'bundle problem', that the subject of thinking is something that must be unified, whereas a mass or collection of matter is a manifold,⁷⁵ much as Kant did more influentially in the first *Critique*. Similarly, Condillac's sensationist epistemology never becomes a 'metaphysics', in the sense of something which might challenge the notion of the soul. This is his main quarrel with Diderot: for Condillac, sensualism shouldn't lead to materialism.

(c) Ironically, the three things Condillac seems to dislike or fear the most here – determinism, the materialist appropriation of the *nihil est* principle, and its being turned into a metaphysics – are precisely those that unfold with Diderot and others, in the next decades.

Actually, some determinist implications of the empiricist credo are visible earlier on: negatively, in Cudworth, and positively, in Locke. Cudworth thought that the empiricist doctrine of the *nihil est* was one of the foundations of atheism and materialism; hence, very systematically, he felt that he had to refute the former doctrine if he was to refute the latter. For instance, he criticized the thesis that "speculative and deliberative thought be always necessary in us," which he saw as flowing from empiricism, according to which thought is "necessarily produced and determined by objects of sense from without." On this view, Cudworth objected, we could never "think of anything, nor speak a word at any time but what objects of sense without did obtrude upon us unavoidably"; we could never "stop the inundation of [our thoughts] flowing in a stream from objects." Empiricism is portrayed here as a determinist and passive doctrine, for in it "we [are] only passive to the present objects of sense before us, all our thoughts being all scribbled or stamped upon our souls by them as upon a sheet of paper"⁷⁶ – language which is quite close to an early critique of the *Essay*

⁷⁴ Cf. Condillac 1749/1991, 139, and his "Dissertation on freedom" appended to the *Traité des sensations*, which deploys classic indeterminist arguments on how the statue is free, although the description of its freedom (using concepts such as 'power') is fully Lockean.

⁷⁵ Condillac 1746, I, i, §§ 7-8.

⁷⁶ Cudworth 1838, § XVI (a text left unpublished at Cudworth's death in 1688, which he intended as a future part of the *Treatise on the Intellectual System of the Universe*); cf. Cudworth 1678, 851-852.

which insisted contra Locke that *Sense* is a “merely perceptive” faculty, “which does nothing else but Perceive,” and is “wholly passive in perceiving”; *Sense* is, with respect to the *Understanding*, “only a Ministerial Faculty.”⁷⁷

As for Locke, in the first draft of the *Essay Concerning Human Understanding* (1671), he had declared – in ‘textbook empiricist’ fashion which he would amend and complexify in later editions of the published work – that

[T]he understanding can no more refuse to have these [ideas of perceived things] or alter them when in it or make new ones to its self & receive new ones into it any other way than by the sense or its owne operation than a mirror can refuse alter or change or produce in its self any other images or Ideas then the objects set before it doe there in produce.⁷⁸

Here the operation of the mind is presented deterministically, in a way which is elaborated in much greater detail in Collins’ work on human liberty (Collins 1717). But as noted above regarding Locke, Collins and Toland, there is no particular interest in the biological specifics or constraints which make an embodied, biological agent a deterministic system, including the hedonistic extension of the *nihil est*. This contrasts with d’Holbach’s articulation of all of these with the functioning of our ‘organism’ (the term used in this context was *organisation*): “As a being organized [*i.e. constituted, CW*] so as to think and feel, you must feel pleasure and pain; you must love or hate according to how your organs are affected by the causes surrounding you or within you.”⁷⁹

All forms of materialism are deterministic, but in different ways: nothing compels the materialist to accept that the body, its fluids (including the animal spirits), its *organisation* and the accompanying structure of the passions, is deterministic *just like* a simple machine – not least since many of these materialists, like Diderot, are also ‘organicists’ who are influenced by the Leibnizian conception of machines of nature as machines down to their smallest parts.⁸⁰ Unsurprisingly, a lot depends on how *causes* are understood, and how much weight they are meant to bear in both an ontology and an account of action. Thus it is quite possible, like Helvétius, d’Holbach or Hobbes before them, to hold that there is a fixed, stable and predictable relation between our sensory input, our mental life and consequently our ‘temper’ and our actions, typically on a hedonistic basis. A crude version of this is

⁷⁷ Mayne 1728, 2, 8. This *Dissertation Concerning Sense, and the Imagination* was attributed to Zachary Mayne, but the only person of that name was long-dead by the time the third edition of the *Essay* was out, which is the text criticized.

⁷⁸ Locke 1990, § 5, 15; this passage of Draft A was not preserved in the *Essay*.

⁷⁹ D’Holbach 1781, I, i, in d’Holbach 1990, I, 18.

⁸⁰ I thank Anne-Lise Rey for this point.

d'Holbach's claim that a brain organized like that of Homer's will necessarily produce the *Iliad*, unless we deny that "causes similar in every way must produce perfectly identical effects"; for d'Holbach, "our minds are subject to the same physical laws as material bodies"⁸¹ – a claim which has very little to do with empiricism! Yet just as empiricism is not as 'passive' a vision of mind as is often thought (e.g. Taylor 1964), its materialist rendition is also not univocally deterministic: for instance, Diderot's doctrine of the senses is less deterministic than what we find in La Mettrie or d'Holbach, or Helvétius, who was his particular target in this respect.

To be sure, Diderot's account of sensation is partly deterministic: "perception comes from sensation; from perception, we get reflection, meditation and judgment. There is nothing free in intellectual operations, or in sensation," and "there is only one operation in man, sensing. This operation . . . is never free."⁸² But at the same time our individuality lies in our *organisation*: not just our mind and its ideas, impressions and memories, but also our body, serve as a *principium individuationis*. Thus he challenges Helvétius' program of reform, which asserts, on the basis of an empiricist-sensualist epistemology (one which Diderot has no quarrel with in itself), that human beings really are *fully modifiable* 'blank slates'.⁸³ It is by denying this 'full modifiability' that Diderot could defend a certain notion of individuality: the fact that individuals differ from each other at the level of their *organisation* grants them a degree of self-determination: "every day, I see men who prefer to die rather than to correct themselves."⁸⁴

As regards the brain, I suggested (§ 4a) that the 'brain-mind' claims in Toland and Collins are more conceptual than they are naturalistic; they are not searching to correlate or identify mental processes ('thoughts') and cerebral processes (or localization), except in an abstract sense. In contrast, in a discussion of the five senses – which he calls the "five witnesses" – Diderot notes that if they are witnesses, they need a "judge," which is the brain: "there is a particular organ, the brain, to which the five witnesses report. This organ deserves particular study."⁸⁵ Of course, this "particular study" is not necessarily experimental; but it

⁸¹ D'Holbach 1781, II, v, in d'Holbach 1990, II, 158-159; d'Holbach 1781, I, xi, in d'Holbach 1990, I, 220.

⁸² *Eléments de physiologie*, in Diderot 1975-, XVII, 335; Diderot on Hemsterhuis, in *ibid.*, XXIV, 300-301.

⁸³ Rousseau also criticises the mechanical dimension of Helvétius' brand of sensualism (*sentir, c'est penser*) in his *Profession de foi du vicaire savoyard* and *Notes sur « De l'esprit »*.

⁸⁴ Diderot, *Le temple du bonheur*, in Diderot 1975-, XVIII, 344. Diderot stressed the enormous variation of traits such as intelligence from one individual to another: the difference between an 'idiot' and a 'genius' hinges on tiny shifts in 'brain fibers', such that one individual differs from another, in terms of intelligence, more than a human being differs from an animal (Hemsterhuis / Diderot 1964, 153).

⁸⁵ *Réfutation d'Helvétius*, II, ch. xii, in Diderot 1975-, XXIV, 549; cf. discussion in Rey 2000.

requires at least the construction of a neuroscientific or neurophilosophical account, like for instance La Mettrie's description of the brain functioning like a harpsichord, with sensitive vibrating chords that form a totality unified by imagination: a system of interlocking and reverberating fibres (i.e. chords), in which sounds and images strike various chords.⁸⁶

So far, so good: the *nihil est* principle allows of deterministic and 'biologizing' extensions. But in what sense can a claim about the nature of knowledge, even if its corporeal and cerebral substrate is 'fleshed out', become a metaphysics? This is what is distinctive in Diderot, particularly in his most dazzling speculative works, the *Lettre sur les aveugles* (1749), for which he spent time in Vincennes prison, its companion piece, the *Lettre sur les sourds et muets* (1751), and *Le Rêve de D'Alembert* (1769), which remained unpublished in his lifetime. Diderot turns the question of the senses and how we know the external world on its head, for each sense, he claims, possesses its own metaphysics: "I have never doubted that the state of our organs and our senses has a great deal of influence on our metaphysics and morals, and our most purely intellectual ideas . . . are tightly connected to the structure (conformation) of our body."⁸⁷ It is a powerful kind of relativism, since each sense creates a world: "how different the morals of the blind is from our own! And that of a deaf man would be different again from the morals of a blind man; and a being with one sense more than we have would find our morals quite lacking."⁸⁸ Further, Diderot reshuffles the hierarchy of the senses, in which vision was classically preeminent, and makes touch fundamental: "how deceptive the organ of the eye would be, if its judgment were not constantly rectified by touch"⁸⁹; touch is "the deepest, most philosophical sense."⁹⁰

Diderot's materialism is conveyed in the first *Lettre* through the character of a blind mathematician, Saunderson – a living counterexample to the argument from design, who often refers to himself as a monster and asks what he did to God to be missing this sense so dear to idealists (sight). Indeed, the implications of the figure of Saunderson are not restricted to the problem of sensory information or even morals: in a conceptual twist, the blind man also stands for the idealist, who cannot see the world in its empirical messiness.⁹¹ This has atheist implications which Locke would not have appreciated: "If you want me to believe in

⁸⁶ *L'Homme-Machine*, in La Mettrie 1987, I, 79-80.

⁸⁷ *Lettre sur les aveugles*, in Diderot 1975-, IV, 48.

⁸⁸ *Ibid.*, 27.

⁸⁹ *Éléments de physiologie*, in Diderot 1975-, XVII, 457.

⁹⁰ *Lettre sur les sourds et muets*, in Diderot 1975-, IV, 140.

⁹¹ *Lettre sur les aveugles*, in Diderot 1975-, IV, 44; the passage continues with an ironic recommendation to Condillac to read Berkeley's *Three Dialogues*.

God, said the blind man, you will have to make me touch him.”⁹² That each sense is constitutive of a metaphysics is a distinctive step further from Condillac’s statue, as is particularly explicit in the tongue-in-cheek reference to an “anatomie métaphysique” in the *Lettre sur les sourds et muets*, which is a twist on the thought-experiment of constructing a person through their senses, since here it is *decomposing* a man into his senses (hence the term ‘anatomy’, used in this sense of a dissection-decomposition into parts), but then showing how each is a world onto itself, like that of the blind mathematician described above:

My idea would be to decompose a man, so to speak, and see what he owes to each of his senses. I remember having sometimes been concerned with this sort of metaphysical anatomy; I found that of all the senses, the eye was the most superficial, the ear the most proud, smell the most hedonistic (*voluptueux*), and taste the deepest and most philosophical.⁹³

That each sense is constitutive of a metaphysics is also, as I have indicated, an ontologization of the *nihil est* principle. After Diderot has restated it in the *Encyclopédie* article “Locke,” he adds a series of consequences which, he says, Locke did not draw; the final one, which he calls “a major rule in philosophy,” is that any utterance that is not related to an object of the senses outside of us, is meaningless.⁹⁴ Further, sensation is life itself: “to sense is to live.”⁹⁵

5. Conclusion: the infallibility of sensation

The shift from empiricism to materialism is not a change in emphasis on the *nihil est* claim and its breadth, although it has indeed been expanded. Rather, from Locke to Diderot, a key difference (first clearly visible in Toland) is the shift in definition of matter, from passive (in Descartes or Locke) to active, contrary to the still-recurrent mistaken belief that materialists viewed processes of the mind as passive “physiological responses” to external stimuli.⁹⁶ For Toland, “Matter neither ever was nor ever can be a sluggish, dead and inactive Lump, or in a state of absolute repose”; “Matter is but Motion under a certain Consideration”;

⁹² *Ibid.*, 48. I cannot discuss here the different ways Diderot privileges the sense of touch, from the *Encyclopédie* article “Epicurisme” to the *Entretiens sur le fils naturel* (“Les sens ne sont tous qu’un toucher”) and the *Discours sur la poésie dramatique*, or the analysis of organs as having a sense of touch in the *Éléments de physiologie*.

⁹³ Diderot, *Lettre sur les sourds et les muets*, in Diderot 1975-, IV, 140.

⁹⁴ Diderot 1765a, IX, 626b.

⁹⁵ *Éléments de physiologie*, in Diderot 1975-, XVII, 447.

⁹⁶ A view found surprisingly in O’Neal’s otherwise useful study on ‘sensationism’ (O’Neal 1996, 206). For a very different view of materialism as non-mechanistic and not passive, see Wolfe 2012.

“action is essential to Matter.”⁹⁷ For Diderot, all of matter is already living and sensing, whether potentially or actually. This has the effect of partly defusing challenges to materialism such as the nature of consciousness, the cogito, or intentionality (if matter itself can think). On the one hand, such properties lose ontological uniqueness in an entirely living, sensing universe: “from the elephant to the flea, from the flea to the sensing and living molecule, the origin of everything, there is not a single point in nature which does not feel pain or pleasure.”⁹⁸ On the other hand, Diderot, in the speculative works cited above but also in his more ‘empirically focused’ *Éléments de physiologie*, which he worked on in the last decades of his life, seeks to articulate a specific account of the nervous system through a variety of metaphors, in support of a materialist conception of the self. Ultimately, the claim that there is nothing in the mind that was not first in the senses can become a claim about the *infallibility of sensation*.

Materialism is, of course, a *realism*. Empiricism can be either a realism (our knowledge is derived from the senses which themselves transmit information about the objects impacting our receptors), or a subjectivism, as Reid and Kant would say (we know only the furniture of our mind). Despite the strong connections made by its friends and foes alike (e.g., Collins and Cudworth, or Cabanis and Madame de Staël), empiricism need not entail materialism, for several reasons. It could also entail Berkeleyan immaterialism (a point first made ... by Lenin, in his book on materialism⁹⁹). Some empiricists explicitly rejected the materialist implications of their work. And not only did the Jansenists accept Locke, other Enlightenment thinkers who rejected materialism accepted the *nihil est*: Bonnet, who tried hard to steer clear of materialism, although his experimental biological work tended to point in that direction, asserted that “each sense has its own mechanics, its way of acting, its goal. Each sense transmits to the mind a welter of different impressions to which as many sensations correspond.”¹⁰⁰ D’Alembert, who actively disagreed with Diderot’s materialism (and was satirized as such in *Le Rêve de D’Alembert*), held the basic principle of metaphysics to be that knowledge is “the result of our sensations.”¹⁰¹

⁹⁷ Toland 1704, Preface, C 3, C 4 and Toland 1704, IV, 160; cf. 135. Spinoza’s system was false for Toland (whose relation to Spinozism is complex) because it failed to ascribe self-action to matter.

⁹⁸ *Rêve de D’Alembert*, in Diderot 1975-, XVII, 140.

⁹⁹ Lenin 1909/1972. For further reflection on the (conceptual) difference between empiricism and materialism regarding the status of mental states, see Armstrong 1968, 122f.

¹⁰⁰ Bonnet 1767, lxxxiii (not in Bonnet 1771-1783, VIII).

¹⁰¹ D’Alembert 1759/1986, ch. IV (“Méthode générale”), 26.

The *nihil est* principle or ‘axiom’ is both fed back into and nourished by the ancient Epicurean theme that sensitivity “cannot lie.” Epicurus had asserted the irrefutability of sensation, that reason is dependent on sensation and that various separate perceptions guarantee the truth of our senses, including in the ‘coherentist’ sense that “if you argue against all your sensations, you will then have no criterion to declare any of them false,”¹⁰² or, in a stronger Epicuro-Lucretian form, “there is no error in sense-perception”¹⁰³ – what recent scholars call the “infallibility” of sensation. Locke also takes up the Epicurean-Lucretian theme, in Book IV of the *Essay*: “This notice by our senses, though not so certain as demonstration, yet may be called knowledge, and proves the existence of things without us”; we can rely on “the assurance we have from our senses themselves, that they do not err in the information they give us of the existence of things without us, when they are affected by them.”¹⁰⁴ What is less generically Epicurean and more distinctively Lockean is his idea that “the certainty of things existing in *rerum Natura*, when we have the testimony of our senses for it, is not only *as great* as our frame can attain to, but *as our condition needs*” (the latter emphasis on the fact that our intellects and sensory apparatus are ‘suited’ or ‘fitted’ to a certain type of world).¹⁰⁵ The irrefutability of sensation is asserted almost identically, but in expanded form, in Nicolas Fréret’s important clandestine work, the *Lettre de Thrasybule à Leucippe* (written in the 1720s-1730s, in circulation from 1745 onwards, although only formally published in 1768): “in the perceptions that come to us from external objects through the senses, we are rarely deceived...”¹⁰⁶ La Mettrie also asserted in his work on happiness that sensations cannot deceive us.¹⁰⁷ Diderot’s elegant version of the infallibility thesis incorporates a hedonistic dimension: “There is no sensed pleasure that is illusory” (“il n’y a point de plaisir senti qui soit chimérique”¹⁰⁸). In that sense the entire history of the *nihil est*, certainly in its eighteenth-century variants, could be retold as a history of hedonism.

¹⁰² Diogenes Laertius 1959, X, 32; Epicurus, *Principal Doctrines*, 23, in Long 1986, 21 (further elaborated in Cicero, *De natura deorum*, I, 70 and *De finibus*, I, 30, 64). As with any other form of empiricism, scholars have debated the meaning of the Epicuro-Lucretian claim: what exactly is it that guarantees the objectivity or infallibility of sensation? a state of affairs? the atomic ‘facts of the matter’? a total experience? and so on.

¹⁰³ Sextus Empiricus, *Against Professors / Adversus Mathematicos*, VIII, 9; Lucretius, *De rerum natura*, IV, 474-499.

¹⁰⁴ Locke 1975, IV.xi.3.

¹⁰⁵ *Ibid.*, IV.xi.8; emphasis in original.

¹⁰⁶ Fréret 1768/1986, § VI.

¹⁰⁷ *Discours sur le bonheur*, in La Mettrie 1987, II, 246.

¹⁰⁸ *Le pour et le contre* (correspondence with Falconet), letter III, in Diderot 1975-, XV, 9; compare Shaftesbury’s description of our sensations as real regardless of the status of the objects in his *Inquiry Concerning Virtue or Merit*: “For let us carry scepticism ever so far, let us doubt, if we can, of everything about us, we cannot doubt of what passes within ourselves. Our passions and affections are known to us. They are

No linear path leads from Lockean empiricism or his doctrine of thinking matter to the emergence of particular sciences, e.g. psychology or neuroscience. Nor do debates on the reality or irrefutability of sensation directly support empirical work on nervous systems. The metaphysics of the senses is a different creature from a science of mind, although it is not opposed to it, and there is not *one* path leading from the *nihil est* principle – itself a child of very mixed or pluralistic parentage, medical, Aristotelian *et al.* – to the brain. But even cerebral materialism is still at a certain remove from brain science: both because experimental neuroscience at its inception deliberately sought to distinguish itself from philosophical materialism (Métraux 2000), and because materialist theories of mind up to the ‘identity theory of mind’ in the twentieth century ignore the neuroscientific details.¹⁰⁹ Empiricism (here encapsulated in the *nihil est* formula) *can* lead to scientific practice – here, the particular case would be the empirical study of the relation between mind and brain – only by adding metaphysical claims that are not themselves ‘empiricist’ (from the deliberate misreading of Locke on thinking matter, to Deschamps’ ‘Spinozism of relations’, in which “sensation and the idea we have of objects are nothing other than these objects themselves, inasmuch as they compose us, and act on our parts, which are themselves always acting on one another,”¹¹⁰ to Diderot’s senses as metaphysics). Among its *non*-scientific outcomes are several noteworthy and original doctrines, or proto-doctrines: the infallibility of sensation, a uniquely medical form of empiricism, and a vital, embodied form of materialism.

certain, whatever the objects may be on which they are employed” (Shaftesbury 1711/1964, I, 336-337); Diderot translated this in 1745.

¹⁰⁹ Bickle, Mandik, and Landreth 2010; Wolfe forthcoming.

¹¹⁰ Deschamps 1993, 404.

References

- (Anon.). Approx. 1725-1730/2003. *L'Âme Matérielle*, ed. A. Niderst, 3^d edition. Paris: Champion.
- d'Argens, J.-B. de Boyer. 1737. *La Philosophie du bon sens, ou Réflexions philosophiques sur l'incertitude des connoissances humaines....* London: La Compagnie.
- Armstrong, D.M. 1968. *A Materialist Theory of Mind*. London: Routledge Kegan Paul.
- Armstrong, D.M. 1978. "Naturalism, Materialism and First Philosophy," *Philosophia* 8(2-3): 261-276
- Ayers, M. 1991. *Locke*, vol. 1: *Epistemology* and vol. 2: *Ontology*. London: Routledge.
- Barnes, A. 1938. *Jean Le Clerc (1657-1735) et la république des lettres*. Paris: Droz.
- Bayle, P. 1727-1731/1964-1968. *Œuvres diverses*, 4 vols. The Hague: P. Husson; reprint, Hildesheim: G. Olms.
- Bayle, P. 1740. *Dictionnaire historique et critique* (1697), 4 vols., 5th edition. Amsterdam-Leyden-The Hague: Pierre Brunel et al.
- Bickle, J., Mandik, P., Landreth, A. 2010. "The Philosophy of Neuroscience," revised version. *Stanford Encyclopedia of Philosophy*, ed. E.N. Zalta, <http://plato.stanford.edu/entries/neuroscience/>
- Bonnet, C. 1767. *Contemplation de la nature*, 3^e éd. augmentée. Yverdon: F.B. de Félice.
- Bonnet, C. 1771-1783. *Œuvres d'histoire naturelle et de philosophie*, 15 vols. en 18 tomes. Neuchâtel: S. Faulche.
- Cabanis, P.-J.-G. 1956. *Rapports du physique et du moral de l'homme* (1802), in *Œuvres philosophiques*, eds. C. Lehec & J. Cazeneuve, 2 vols. Paris: PUF.
- Chaumeix, A.-J. 1758-1759. *Préjugés légitimes contre l'Encyclopédie et essai de réfutation de ce dictionnaire, avec un Examen critique du livre De L'Esprit*, 8 vols., Bruxelles/Paris: Hérisant.
- Clarke, S. 1738/1978. *The Works of Samuel Clarke*, 4 vols. Reprint, New York: Garland.
- Collins, A. 1707. *Reflections on Mr. Clark's Second Defense of his Letter to Mr. Dodwell ...*, in Clarke 1738, vol. 3
- Collins, A. 1708. *An Answer to Mr. Clarke's Third Defense of his Letter to Mr. Dodwell ...*, in Clarke 1738, vol. 3.
- Collins, A. 1717/1978. *A Philosophical Inquiry Concerning Human Liberty*. London; reprint, New York: Garland.
- Condillac, É. Bonnot de. 1746. *Essai sur l'origine des connaissances humaines*, 2 vols. Amsterdam: Pierre Mortier.
- Condillac, É. Bonnot de. 1749/1991. *Traité des systèmes*. Paris: Fayard.
- Condillac, É. Bonnot de. 1948-1951. *Œuvres philosophiques de Condillac*, ed. G. Le Roy, 3 vols. Paris: PUF.
- Condillac, É. Bonnot de. 1953. *Lettres inédites à G. Cramer*. Paris: PUF.
- Condorcet, J.-A.-N. de Caritat, Marquis de. 1847-1849. *Œuvres de Condorcet*, eds. A. Condorcet-O'Connor & F. Arago. Paris: Firmin Didot.
- Cranefield, P. F. 1970. "On the origin of the phrase *nihil est in intellectu*," *Journal of the history of medicine and allied sciences* 25: 77-80.
- Cranston, M. 1957/1985. *Locke. A Biography*. Reprint, Oxford: Oxford University Press.

- Cronk, N. 2001. "The *Letters concerning the English nation* as an English work: reconsidering the Harcourt Brown thesis," *SVEC* 10: 226-223
- Cudworth, R. 1678. *The True Intellectual System of the Universe*. London: R. Royston.
- Cudworth, R. 1731. *Treatise Concerning Eternal and Immutable Morality*. London: James & John Knapton.
- Cudworth, R. 1838. *A Treatise of Freewill*, ed. J. Allen. London: John Parker.
- Cunningham, A. 2010. *The Anatomist Anatomis'd: An experimental discipline in Enlightenment Europe*. Aldershot: Ashgate.
- Daled, P. 2005. *Le matérialisme occulté et la genèse du sensualisme*. Paris: Vrin.
- D'Alembert, J. le Rond. 1759/1986. *Essai sur les Éléments de philosophie*. Paris: Fayard.
- Della Croce, G. A. 1583. *Cirugia universale, e perfetta di tute le parti pertinenti al'ottimo chirurgo*. Venice: Presso Giordano Ziletti.
- Deschamps, L.-M. 1993. *Œuvres philosophiques*. Paris: Vrin.
- Diderot, D. 1765a. "Locke," *Encyclopédie* IX, 625-627. Paris: Briasson.
- Diderot, D. 1975-. *Œuvres complètes*, eds. H. Dieckmann, J. Proust & J. Varloot. Paris: Hermann.
- Diderot, D. and D'Alembert, J. le Rond, eds. 1765. *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers...* Paris: Briasson.
- Diogenes Laertius. 1959. *Lives and Opinions of the Eminent Philosophers*. London: Heinemann.
- Downing, L. 2007. "Locke's Ontology," in L. Newman, ed., *The Cambridge Companion to Locke's Essay*, 352-380. Cambridge: Cambridge University Press.
- Du Bois-Reymond, E. 1912. "Über die Grenzen des Naturerkennens" (1872), in E. Du Bois-Reymond, ed., *Reden von Emil du Bois-Reymond in zwei Bänden*. Vol. 1, 2. Vervollständigte Auflage, 441-473. Leipzig: Veit & Co.
- Duchesneau, F. 1973. *L'Empirisme de Locke*. The Hague: Martinus Nijhoff.
- Fallopium, G. 1566. *Opuscula*. Padova: Luca Bertelli.
- Fallopium, G. 1584. *Opera quae adhuc extant omnia*. Frankfurt: apud haeredes Andreae Wecheli.
- Figlio, K. 1975. "Theories of Perception and the Physiology of Mind in the Late Eighteenth Century," *History of Science* 13(3): 177-212.
- Fioravanti, L. 1582. *La Cirurgia di Fioravanti* (1570). Venice: heredi di Melchior Sessa.
- Fontenelle, B. le Bovier de. 1818. *Œuvres complètes*. Paris: Belin.
- Formey, J.H.S. 1747. *Recherches sur les éléments de la matière*. n.p.
- Frérét, N. 1768/1986. *Lettre de Thrasybule à Leucippe*, ed. S. Landucci. Florence: Olschki.
- Gaukroger, S. 2005. "The Autonomy of Natural Philosophy: From Truth to Impartiality," in P. Anstey & J. Schuster, eds., *The Science of Nature in The Seventeenth Century. Patterns of Change in Early Modern Natural Philosophy*, 131-163. Dordrecht: Springer.
- Gaukroger, S. 2010. *The Collapse of Mechanism and the Rise of Sensibility: Science and the Shaping of Modernity, 1680-1760*. Oxford: Oxford University Press.
- Haakonssen, K. 2006. "The concept of eighteenth-century philosophy," in Haakonssen, ed., *The Cambridge History of Eighteenth-Century Philosophy*, 3-25. Cambridge: Cambridge University Press.

- Hankinson, R.J. 1995. "The Growth of Medical Empiricism," in D. Bates, ed., *Knowledge and the Scholarly Medical Traditions*, 60-83. Cambridge: Cambridge University Press.
- Hambridge, R.A. 1982. "'Empiricomany, or an Infatuation in Favour of Empiricism or Quackery': The Socio-Economics of Eighteenth-Century Quackery," in S. Soupel and R.A. Hambridge, eds., *Literature and Science and Medicine*, 47-102. Los Angeles: Clark Memorial Library, University of California.
- Hamou, P. 2004. "L'opinion de Locke sur la "matière pensante," *Methodos 4: Penser le corps*, <http://methodos.revues.org/123>
- Harris, J. 2005. *Of Liberty and Necessity. The Free Will Debate in Eighteenth-Century British Philosophy*. Oxford: Clarendon Press.
- Hartley, D. 1749. *Observations on Man, His Frame, His Duty and his Expectations*, 2 vols. London: Richardson.
- Harvey, W. 1628/1976. *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus*, trans. G. Whitteridge. Oxford : Blackwell Scientific Publications.
- Hazard, P. 1935/1963. *La crise de la conscience européenne, 1680-1715*. Paris, Fayard.
- Hegel, G.W.F. 1830/1959. *Enzyklopädie der philosophischen Wissenschaften im Grundrisse*, eds. F. Nicolin & O. Pöggeler. Hamburg: Meiner.
- Hemsterhuis, F., Diderot, D. 1964. *Lettre sur l'homme et ses rapports, avec le commentaire inédit de Diderot*, ed. G. May. New Haven: Yale University Press / Paris: PUF.
- Hobbes, T. 1976. *Thomas White's 'De Mundo' Examined*, trans. H.W. Jones. London: Bradford University Press.
- D'Holbach, P.-H. T., Baron. 1781/1990. *Système de la Nature ou des lois du monde physique et du monde moral* (1st edition 1770), 2 vols.; reprint, ed. J. Boulad-Ayoub. Paris: Fayard, coll. "Corpus".
- Itard, J.-M. G. 1994. "Rapport sur les nouveaux développements de Victor de l'Aveyron" (1806), in Itard, *Victor de l'Aveyron*. Paris: Allia.
- Jolley, N. 1999. *Locke. His Philosophical Thought*. Oxford: Oxford University Press.
- Kant, I. 1900. *Kants gesammelte Schriften*. Hrsg. von der Königlich Preussischen Akademie der Wissenschaften zu Berlin. Reprint, Berlin: De Gruyter.
- Kant, I. 1997. *Critique of Pure Reason*, trans. A. Wood. Cambridge: Cambridge University Press.
- La Mettrie, J.O. de. 1987. *Œuvres philosophiques*, ed. F. Markovits, 2 vols. Paris: Fayard-"Corpus".
- Lagarde, A., Michard, L. 1960. *Les Grands Auteurs français du programme*, 6 vols. Paris: Bordas.
- Laudan, L. 1981. "Locke on Hypotheses: Placing the *Essay* in the 'Scientific Tradition'" (1967), revised version in Laudan, *Science and Hypothesis*, 59-71. Dordrecht: Reidel.
- Le Camus, A. 1753. *Médecine de l'esprit, où l'on traite des dispositions et des causes physiques qui sont des conséquences de l'union de l'âme avec le corps, influant sur les opérations de l'esprit ...* Paris: Ganeau.
- Lega, B.C. 2006. "An Essay Concerning Human Understanding: How the *Cerebri Anatome* of Thomas Willis Influenced John Locke," *Neurosurgery* 58: 567-576
- Lenin, V.I. 1909/1972. *Materialism and Empirio-Criticism*. In Lenin, *Collected Works*, vol. 14, 17-362. Moscow: Progress Publishers.

- Lloyd, H.M. forthcoming. “Sensibilité, Embodied Epistemology and the *Encyclopédie*,” in H.M. Lloyd, ed., *Sensibilité: The Knowing Body in the Enlightenment*. Dordrecht: Springer.
- Locke, J. 1975. *Essay Concerning Human Understanding*, ed. P. Nidditch. Oxford: Oxford University Press.
- Locke, J. 1978. *Examen de “La Vision en Dieu” de Malebranche*. Introduction, traduction et notes par J. Pucelle. Paris: Vrin.
- Locke, J. 1989. *Correspondence*, ed. E.S. De Beer, vol. 8. Oxford: Clarendon Press.
- Locke, J. 1990. *Drafts for the Essay Concerning Human Understanding, and Other Philosophical Writings*, vol. 1: *Drafts A and B*, eds. P.H. Nidditch and G.A.J. Rogers. Oxford: Clarendon Press.
- Long, A.A. 1986. *Hellenistic Philosophy: Stoics, Epicureans, Sceptics*, 2nd edition. Berkeley: University of California Press.
- McCann, E. 2002. “John Locke,” in S. Nadler, ed., *A Companion to Early Modern Philosophy*, 354-374. Oxford: Blackwell.
- Malebranche, N. 1979. *La Recherche de la Vérité* (1674), in *Œuvres*, ed. G. Rodis-Lewis, vol. 1. Paris: Gallimard-Pléiade.
- Mandeville, B. 1730/1976. *A Treatise of the Hypochondriack and Hysterick Diseases, in Three Dialogues*, 2nd corrected edition, London: Tonson; reprint, Delmar, N.Y.: Scholars’ Reprints.
- Maubec, A. 1709. *Principes phisiques de la raison, et des passions des hommes*. Paris: B. Girin. <http://lgxserver.uniba.it/lei/filmod/testi/principes.html>
- Mayne, Z. (attributed to). 1728. *Two Dissertations Concerning Sense, and the Imagination. With an Essay on Consciousness*. London: J. Tonson.
- Métraux, A. 2000. “The emergent materialism in French clinical brain research (1820-1850). A case study in historical neurophilosophy,” *Graduate Faculty Philosophy Journal* 22:1 (special issue: *The Renewal of Materialism*): 161-189
- Milton, J.R. 2001. “Locke, Medicine and the Mechanical Philosophy,” *British Journal of the History of Philosophy* 9(2): 221-243
- Montaigne, M. de. 1992. *Essais* (1588), ed. P. Villey, 2nd ed. Paris: PUF.
- Nagel, J. 2006. “Empiricism,” in S. Sarkar & J. Pfeifer, eds., *The Philosophy of Science: An Encyclopedia*, 235-243. London: Routledge.
- Norton, D.F. 1981. “The Myth of British Empiricism,” *History of European Ideas* 1(4): 331-344
- O’Neal, J. 1996. *The Authority of Experience: Sensationist Theory in the French Enlightenment*. University Park, PA: Pennsylvania State University Press.
- Park, K. 1988. “The Organic Soul,” in C.B. Schmitt and Q. Skinner, eds., *The Cambridge History of Renaissance Philosophy*, 464-484. Cambridge: Cambridge University Press.
- Parmentier, M. 2002. *Le vocabulaire de Locke*. Paris: Ellipses.
- Pluquet, F.-A.-A., Abbé. 1757. *Examen du Fatalisme, ou Exposition et réfutation des différens systèmes de Fatalisme qui ont partagé les Philosophes sur l’origine du monde, sur la nature de l’âme et sur le principe des actions humaines*, 3 vols. Paris: Didot & Barrois.
- Proust, J. 1995. *Diderot et l’Encyclopédie*, 4th revised edition. Paris: Albin Michel.

- Régis, P.-S. 1704. *L'Usage de la raison et de la foi, ou l'accord de la foi et de la raison*. Paris: chez Jean Cusson.
- Rey, R. 2000. "Diderot and the Medicine of the Mind," *Graduate Faculty Philosophy Journal* 22:1 (special issue: *The Renewal of Materialism*): 149-159
- Roche, A.-M. 1759. *Traité de la nature de l'âme, et de l'origine de ses connaissances. Contre le Système de M. Locke et de ses Partisans*, 2 vols. Paris: Lottin.
- Rogers, G.A.J. 2007. "The Intellectual Setting and Aims of the *Essay*," in L. Newman, ed., *The Cambridge Companion to Locke's "Essay Concerning Human Understanding"*, 7-32. Cambridge: Cambridge University Press.
- Romanell, P. 1984. *John Locke and Medicine*. Amherst, NY: Prometheus Books.
- Sainte-Beuve, C.-A. 1988. *Mes poisons*. Paris: José Corti.
- Schneewind, J. 2006. "The Active Powers," in K. Haakonssen, ed., *The Cambridge History of Eighteenth-Century Philosophy*, 557-607. Cambridge: Cambridge University Press.
- Shaftesbury, A. Ashley Cooper, Earl of. 1711/1964. *Characteristicks of Men, Manners, Opinions, Times*, ed. J. M. Robertson. Indianapolis/New York: Bobbs Merrill.
- Smith, C.U.M. 1987. "David Hartley's Newtonian Neuropsychology," *Journal of the History of the Behavioral Sciences* 23: 87-101
- de Staël-Holstein, A.-L.-G. Necker, Baronne. 1820. *Œuvres complètes*. Brussels: Wahlen.
- Sutton, J. 1998. *Philosophy and Memory Traces. Descartes to connectionism*. Cambridge: Cambridge University Press.
- Sutton, J. 2010. "Carelessness and Inattention: Mind-Wandering and the Physiology of Fantasy from Locke to Hume," in C.T. Wolfe and O. Gal, eds., *The Body as Object and Instrument of Knowledge: Embodied Empiricism in Early Modern Science*, 243-263. Dordrecht: Springer.
- Taylor, C. 1964. *The Explanation of Behavior*. London: Routledge Kegan Paul.
- Thiel, U. 1998. "Locke and Eighteenth-Century Materialist Conceptions of Personal Identity," *Locke Newsletter* 29: 59-83
- Thomson, A. 2008. *Bodies of Thought: Science, Religion, and the Soul in the Early Enlightenment*. Oxford: Oxford University Press.
- Toland, J. 1704/1976. *Letters to Serena*. London: B. Lintot; reprint, New York: Garland.
- Vartanian, A. 1953. *Diderot and Descartes*. Princeton: Princeton University Press.
- Vila, Anne C. 1998. *Enlightenment and Pathology. Sensibility in the Literature and Medicine of Eighteenth-Century France*. Baltimore: Johns Hopkins University Press.
- Willis, T. 1683. *Two Discourses Concerning the Soul of Brutes, Which is That of the Vital and Sensitive [Soul] of Man...*, a translation of *De anima brutorum* (1672), Englished by S. Pordage. London: Dring, Harper and Leigh.
- Wolfe, C.T. 2007. "Determinism/Spinozism in the Radical Enlightenment: the cases of Anthony Collins and Denis Diderot," *International Review of Eighteenth-Century Studies* 1 (special issue: *Boundaries in the Eighteenth Century*): 37-51
- Wolfe, C.T. 2009. "A happiness fit for organic bodies: La Mettrie's medical Epicureanism," in N. Leddy & A. Lifschitz, eds., *Epicurus in the Enlightenment*, 69-83. Oxford: Voltaire Foundation.

- Wolfe, C.T. 2010. "Empiricist heresies in early modern medical thought," in C.T. Wolfe & O. Gal, eds. *The Body as object and instrument of knowledge. Embodied empiricism in early modern science*, 333-344. Dordrecht: Springer.
- Wolfe, C.T. 2012. "Forms of Materialist Embodiment," in M. Landers and B. Muñoz, eds., *Anatomy and the Organization of Knowledge, 1500-1850*, 129-144. London: Pickering and Chatto.
- Wolfe, C.T. forthcoming. "'The brain is a book which reads itself'. Cultured brains and reductive materialism from Diderot to J.J.C. Smart," in H. Groth and C. Danta, eds., *Mindful Aesthetics: Literature and the Science of Mind*. London: Continuum.
- Wolfe, C. T. and Salter, A. 2009. "Empiricism contra Experiment: Harvey, Locke and the Revisionist View of Experimental Philosophy," *Bulletin de la SHESVIE* 19(2): 113-140
- Wolfe, Charles T. and van Esveld, M. forthcoming. "The Material Soul: Strategies for Naturalising the Soul in an Early Modern Epicurean Context," in D. Kambaskovic-Sawers, ed., *Conjunctions: Body and Mind, Sexuality and Spirit from Plato to Descartes*. Dordrecht: Springer.
- Wright, J.P. 1987. "Association, Madness and the Measures of Probability in Locke and Hume," in C. Fox, ed., *Psychology and Literature in the Eighteenth Century*, 1–29. New York: AMS Press.
- Wright, John P. 1991. "Locke, Willis, and the Seventeenth-Century Epicurean Soul," in M.J. Osler, ed., *Atoms, Pneuma, and Tranquillity: Epicurean and Stoic Themes in European Thought*, 239-258. Cambridge: Cambridge University Press.
- Yolton, J.W. 1991. *Locke and French Materialism*. Oxford: Clarendon Press.