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Materialism: A Historico- Philosophical Introduction



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Chapter 1

(Introduction): Materialism, Opprobrium and the History of Philosophy

Le mal, c'est la matière. Arbre noir, fatal fruit.

(V. Hugo, *Les Contemplations* (Hugo, *Les Contemplations*, § XXVI: “*Ce que dit la bouche d'ombre*,” 1855, in Hugo (1968), 373. All translations are my own unless otherwise indicated).

Abstract Materialism – the philosophical doctrine that ‘Everything that exists, is material’, including human beings, who cannot then have an immortal soul – has been a heretical or clandestine teaching since the beginnings of philosophy. Its main crime is “explaining the higher level in terms of the lower level,” as Auguste Comte put it; this in turn is supposed to lead straight to immoralism: even Darwin denied that he was a materialist! At the same time, materialism is said to be the position which somehow facilitated and prepared the advent of modern science, particularly physical and biological science. What then is materialism? Is there only one, or are there many variants? I will mainly examine the first sustained materialist school in modern philosophy, in eighteenth-century French thought, chiefly represented by La Mettrie and Diderot, but also other figures notably in England. In addition, I will draw some contrasts between ‘French materialism’ and contemporary philosophy of mind, in which the dominant question is the relation between mind and brain.

1.1 Definitional Problems

The great eighteenth-century materialist and sometime physician Julien Offray de La Mettrie (1709–1751) once wrote, with what now seems like great clairvoyance given the last years of his life and his immediate posterity, that “he who chooses man as an object of study must expect to have man as an enemy.”¹ Hopefully, the situation for the historian of philosophy who takes ‘materialism’ as an object of study is a bit different, but here, new problems arise. Notoriously, ‘materialism’ is a slippery term, referring to a “discontinuous” object, from its origins in

¹ *Discours sur le bonheur*, in La Mettrie (1987), II, 269.

pharmaceutical language (a materialist was someone who prepared the *material medica*²) to “its Epicurean, Stoic, Averroist or Alexandrian Peripatetic and even Paduan avatars,”³ and onto cerebral materialism in the nineteenth century, physicalism in the twentieth, and so on. But the challenges posed by materialism as a historico-philosophical object are not just an effect of shifting meanings, historical and/or scientific contexts, or even its self-understanding (consider that anti-clerical materialism will have, at least for the most part, different goals and criteria of validity than neurophilosophy). They include the significant fact that unlike, say, ‘idealism’, it is at first a *polemical* term, primarily defined by its opponents, including authors who subdivide materialism into many more precise genres, the better to refute them; indeed, apologeticists often prove to be excellent guides to the internal structures of heterodox thought (leaving aside the question of whether these apologetic texts actually *invent* these argument structures, as is claimed in Kors 1990).

So materialism first appears on the scene as an articulated philosophical position *defined by anti-materialists*, one which was indeed primarily or even exclusively used to disqualify the opponent. Gradually, some nuances appear, as when the Cambridge Platonist Henry More allows, in his 1668 *Divine Dialogues*, for a distinction between good and bad kinds of materialists, where the former defend a form of mechanism, without holding that everything reduces to matter, as the latter do.⁴ It seems that it was (appropriately) in the context of the Radical Enlightenment that the term ‘materialist’ was first used by a thinker, La Mettrie, to describe himself, rather than strictly as a term of opprobrium (Bloch 1995). Thereafter, in the second half of the eighteenth century, it starts to be used positively but still with a polemical charge, so that authors have to defend themselves, e.g., against the charge of libertinage: thus Diderot, responding to the Dutch natural philosopher Hemsterhuis’ request for commentary on his manuscript, observes that Hemsterhuis reasons “as if libertinage was a necessary consequence of materialism, which seems to me to match neither reason nor experience.”⁵ That Diderot went to prison for his *Letter on the Blind* of 1749, and La Mettrie had to flee, not just to the Low Countries but ultimately to the exile of Frederick the Great’s court in Potsdam, only adds some bitterness to such sentiments.

In the nineteenth century, materialism takes on a meaning familiar to us today, as the science-friendly doctrine, the ideological combatant for science but also its ‘valet’, leading to a rather pronounced split in possible meanings, between the negative usage (often with ethical overtones, as discussed in Chap. 5) and a positive usage that overemphasizes this connection to science, neglecting some differences

²Bloch, “Sur les premières apparitions du mot ‘matérialiste’,” in Bloch (1998).

³Mothu (1990–1991), 318. On materialism as a “discontinuous” philosophical tradition (contrary to the monolithic vision found in the attempts at surveying the movement as a whole), see Mensching (2000), 525.

⁴More describes the better specimen of materialist, the character Hylobares, as “a young, witty, and well moralised Materialist,” in a passage well-known to historians of materialism (More 1668, 5–6). For more on the history of the term see Bloch (1995), (1998) and Benítez (1998), 355 (signaling an earlier usage in French, in Friedrich Spanheim’s 1676 *L’impie convaincu*) and on the German context, Rumore (2013) and Wunderlich (2015).

⁵*Observations sur Hemsterhuis*, in Diderot (1975-), XXIV, 251.

between philosophical concepts and empirical claims (as discussed with regard to brain-mind identity theories in Chap. 7). In some cases materialism is also located somewhere in between these extremes, in a sort of transitional understanding, as in when the young Charles Darwin, toying with implications of ‘animal minds’ and seeking to go beyond Locke, suddenly comments to himself in (mock?) horror, “Oh you materialist!”⁶

How do we handle such a shifting word? How do we analyse a doctrine which – aside from the rather banal fact that it had, and has partisans and detractors, doubtless like many other doctrines although in an especially charged manner – seems to be an alluring vision, “the most seductive philosophy”⁷ in Diderot’s words, the most liberating, in an Epicurean sense, but also, to others, the most sterile and inhuman philosophy? (Or, which does not match either of those very normatively invested visions, a kind of reasonable, naturalistically oriented vision of the world?) In the Marquis de Sade’s novels, the most explicit scenes are often precipitated by a libertine character delivering a short, emphatic *petitio principii* of materialism, as a kind of particularly refined stimulus for erotic activity (Warman 2002). In contrast, Raymond Ruyer (a philosopher of the 1940s–1960s whose influence on Deleuze means that he is being rediscovered today), suggests a thought-experiment in an article entitled ‘What is Living and What is Dead in Materialism’, which has gone rather unnoticed (it appeared in 1933...). Ruyer suggests that we imagine a law court as seen through the eyes of a materialist: “The halo of meanings, essences and values,” in other words, everything relevant about the scene, vanishes, and what is left is the “functioning of a sort of complicated mechanics” whereby brains produce articulations, which in turn generate vibrations in the air, and thereby modify other nervous systems (Ruyer 1933, 28). Everything takes place in the present, which is made up of strictly quantifiable events; psychological or social reality is an emanation which can always be reduced to physical processes. Basically, materialism in this argument *ad absurdum* is a strange kind of reductionism which denies the reality of social institutions, values, and of course minds.

In the first case, materialism is a process of elimination of superstition and the forces which constrain the pleasure of life, as La Mettrie would write in his scandalous *Anti-Seneca* (also published as *Discourse on Happiness*). In the second, it is a theory of reality which seeks to apply the ‘rigor’ or ‘quantification’ of physics to all aspects of reality – but in a kind of illegitimate transposition or category mistake, which we will encounter in another form with regards to the identification of mental life with cerebral processes, in Chaps. 6, 7, and 8. Its most classic form was represented by the German ‘vulgar materialist’ Carl Vogt’s slogan stating that

all the properties we refer to as the activity of the soul are just functions of cerebral substance, and to put this more crudely, *thought is (more or less) to the brain what bile is to the*

⁶Darwin, Notebook C, in Darwin (1996), 71; but this has nothing to do with the metaphysics of matter; Michael Ruse’s statement that Darwinism is “the apotheosis of a materialistic theory” (Ruse 2000, 77), lacking conceptual or historical finesse, does not help us understand Darwin – or materialism – any better.

⁷*Pensées sur l’interprétation de la nature* § li, in Diderot (1975-), IX, 84.

liver and urine to the kidneys. It is absurd to allow for an independent soul using the brain as an instrument...⁸

That the biochemical reductionism of the *Vulgärmaterialisten* was meant to be part of a socialist program of equality and elimination of class differences, does not really enter into this story, although it fits with the often expressed fear that materialism meant a kind of ‘downwards’ reduction, not just at the metaphysical level, but also in terms of basic human (and social) values: in 1873, one Doctor Desgrange asserted, in an address to the Société de médecine of Lyon, that “the most fearsome enemy of society today is the *materialist School*, whose doctrines begin at the highest levels of science, and then descend towards the lower classes, warping their ideas with breathtaking speed.”⁹

What is more relevant in Ruyer’s rather feverish denunciation of materialism as a reduction of the world of symbolic value to a set of vibrations in the air caused by solid objects – a vision in which, to quote Father Dominique Dubarle, “The material world is what remains of reality once one forbids oneself from including in it anything vital or mental”¹⁰ – is that it captures two recurrent definitional and polemical problems of materialism, visible already in Aristotle’s critique of the atomists (Chap. 2), and in different forms in debates over early modern materialism (Chaps. 4 and 5) but also the Identity Theory in the twentieth century (Chap. 7): the problem of *reductionism*, and by extension, the question, *reduction to what?*, which opens onto the issue that will be termed physicalism. Is materialism a reduction to physicalism? I do not pretend to answer this question in this book, especially not in an Introduction, but the reader may make her judgment based on some of these chapters (and differently put, physicalism is something of a negative *Leitfaden* in my story). In the name of completeness, it is worth considering an answer to Ruyer’s objection, not to him in particular, but to this type of anti-materialist argument. The answer is Quine’s:

Send a man into another room and have him come back and report on its contents. He comes back and agitates the air for a while, and in consequence of this agitation we learn about objects in the room which are very unlike any agitation of the air. Selected traits of objects in that room are coded in traits of this agitation of the air. The manner of the coding, called language, is complicated and far-fetched, but it works; and clearly it is purely structural, at least in the privative sense of depending on no qualitative resemblances between the objects and the agitation. Also the man’s internal state, neural or whatever, in which his knowledge of the objects in that room consists, presumably bears none but structural relation to those objects; structural in the privative sense of there being no qualitative resemblances between the objects and the man’s internal state, but only some sort of coding, and, of course, causation. ... I do think there is a substantial resemblance between our internal

⁸ Vogt, *Physiologische Briefe* (original publication, 1847), in Vogt 1875, 347–348 (Vogt’s 13th Inaugural Lecture at the University of Giessen in 1845). For a similar formulation to Vogt’s (thought=bile) see Cabanis (1802), 151 (the lectures forming the basis of the latter publication were given in the late 1790s).

⁹ Desgrange (1873), 15.

¹⁰ Dubarle (1953), 46.

state ... and the man's internal state ... This I find plausible on broadly naturalistic grounds.¹¹

The force in Quine's account lies, at least for my purposes, in how *open* it is: the mere 'physics' of vibration or here, agitation, seems to open onto the vast vistas of naturalism.

But now we run the risk of succumbing to a classic temptation, by entering onto the terrain first staked out by Friedrich Lange in his *History of Materialism* back in the 1860s: Lange sought to produce an exhaustive presentation of materialism in all its historical forms, in order to refute it (the book is subtitled, after all, 'critique of its present-day significance'). To enter on such terrain means producing militant defences of the 'truth' of materialism, in a mirror image of Lange's refutation.¹² It is important, on methodological but perhaps also on fundamental philosophical grounds, to see that an attempt to understand what might be in common in the diverse forms of materialism, does not necessarily mean to assert its 'truth' in some meta-historical sense (including as a purportedly 'scientifically founded' truth), nor to propose one of the various post-May 68 'war machines' in the history of philosophy, intended to roll back forms of power, domination and repression.¹³

To put it differently, the following chapters are not presented as a watertight, militant counter-history of philosophy in which Lucretius, La Mettrie, Diderot, Vygotsky, Quine and Dennett form a counter-narrative against a history in which Aristotle, Descartes, Kant and Hegel are the heroes. They *do* seek to do justice to such figures over and against the impoverished and sometimes downright false presentations given both in *histories* of philosophy and in *canonical works* of philosophy (with an exception being Aristotle's critique of materialism, discussed in Chap. 2, which is not a mere attempt at disqualification but a serious engagement with competing explanations of natural processes). In order to do justice to this historical complexity, I wish to return to the fact I mentioned at the outset, that materialism is born as a 'labelled' philosophical movement in an atmosphere of opprobrium. For if we leave this out, we then retreat behind a catalogue of historical definitions. Yet I should also like to set out some typological elements concerning 'forms of materialism', before turning to my particular cases in the following chapters.

¹¹ Quine (1981), 176.

¹² Thus two earlier studies of the topic, Charbonnat (2007) and Vitzthum (1995), tend to overly favor the 'truth' of materialism, perhaps inadvertently mirroring the only other history of materialism, Lange's (1892/1974), which was intended as a careful, thorough refutation.

¹³ Cf. "L'histoire de la philosophie a toujours été l'agent de pouvoir dans la philosophie, et même dans la pensée" (Deleuze 1979, 19–21).

1.2 Dead Matter and the Opprobrium of Materialism

Materialism has long had a bad reputation, on two distinct yet related grounds: that it *reduces everything to 'dead' matter*, and that it eliminates the 'higher', intellectual or spiritual parts of life, and thereby cannot but be *immoral*. This set of accusations came to a head in the period we now know as the Radical Enlightenment,¹⁴ when, building on Paduan Averroist Aristotelianism (e.g. Pomponazzi), neo-Epicureanism and other partly clandestine elements, thinkers first assert themselves as materialists, boldly and confidently. One may ask (as I do in Chaps. 4 and 5) whether these materialists, preachers of the pleasures of the flesh and otherwise deniers of an immortal or any other transcendent source of normativity (and thus basis for reward or punishment) were as coldly mechanistic and immoral as we are often told.

It has been said that the history of philosophy is the history of idealism. This is of interest, less as a truth claim (surely dependent on all sorts of presuppositions about the nature of philosophy, among others), and more because of it what it reveals. The import of this revelation is twofold: philosophy frequently and canonically has understood itself as idealism, both because of its opprobrium against materialism, and because of the reflexive belief – inseparably systematic and historical – that from Plato and Aristotle to Descartes, Kant and Hegel (and beyond), a philosophy is at its core a system of interlocking principles with a rational foundation. On this view, it cannot be an appeal to merely empirical, contingent properties, and still less a 'reductionist' explanation of the higher-level (consciousness, intentionality, action overall) in terms of the neuronal or biochemical properties of nematodes, sea slugs, macaques or orang-outangs. All true philosophies are then forms of idealism, while materialism is *Unphilosophie*, non-philosophy (Colletti 1979, 10, 35–36) – a position that has a Hegelian ring to it (after all, for Hegel, "Every philosophy is an idealism"¹⁵), but that extends beyond: Schopenhauer had declared that the "true philosophy" was in any case idealism, while materialism is the philosophy of "the subject who forgets to account" for herself.¹⁶

The opposition between idealism and materialism certainly runs deep. The eminent scholar of French materialism, Olivier Bloch, has recalled that Plato, in the *Sophist* (246b-c), features a 'battle of giants' (*gigantomachia*) between the Lovers of Forms and those he calls the Sons of the Earth, his early version of the figures we might call the 'crude materialists'. The latter come in different guises, for Plato:

¹⁴I am not concerned here with (a) the difference between Margaret Jacob's and Jonathan Israel's concepts of 'radical Enlightenment' or (b) the internal conceptual success and consistency of the latter (heavily debated e.g. in Secrétan et al., eds., 2007). As regards the role of Spinozism, I take it as more of a construct than a real relation to Spinoza (following Citton 2006), that is, a conceptual construct which need not involve first-hand acquaintance with the writings of Spinoza. For my approach to Spinozism in the Radical Enlightenment see Wolfe (2007) and (2014).

¹⁵Hegel (1989), 155 and Hegel (1971), 124 (where he adds, "Every philosophy is an idealism; there has never been any philosophy other than the self-knowledge of Spirit").

¹⁶Schopenhauer, *Die Welt als Wille und Vorstellung*, II, 1 ("Zur idealistischen Grundansicht"), in Schopenhauer (1977), 11, 27.

there are those who explain everything about our bodies and life in terms of the Earth, and thereby confuse human life with the existence of trees and stones; there are those who obsessively take apart reality into tiny atomic components and view the universe as perpetually changing. This contrasts with Aristotle's extensive (and, in my view, more sophisticated) presentation of and 'debate' with materialism, discussed in Chap. 2. The stupidity of such thinkers is mirrored (or matched) by the purported stupidity of matter itself, a motif much belabored in early modernity: e.g., the Cambridge Platonist Ralph Cudworth spoke of "stupid and senseless Matter" in his posthumous *Treatise concerning Eternal and Immutable Morality* (Cudworth 1897, I, chapter II, § 8, 839).

This theme of the 'stupidity' of matter reaches something of a fever point in the seventeenth and early eighteenth centuries: for Cudworth, "Mind and Intellect are a higher, more real and substantial Thing than senseless Body and Matter," and he of course denied that "all Being and Perfection that is found in the World" could "spring up and arise out of the dark Womb of unthinking Matter" (slightly mixing metaphors, one might say: *op. cit.*, § 13, 846). The great Jansenist Pierre Nicole, who significantly influenced Locke, also wrote around the same time that one cannot conceive of "this dead and unfeeling mass we call matter" as being "an eternal being"; it is clear, Nicole continues, that "matter lacks any internal cause of its existence ... it is ridiculous to attribute to the most vile and despicable of all beings, the greatest of perfections, which is to exist by oneself [*d'être par soi-même*]" (Nicole 1671, in Nicole 1714, 27). The Jesuit *Dictionnaire de Trévoux* (first edition, 1704) does not insult matter or materialism for what it does to "perfections" such as intelligence or autonomous existence, but opts for an equally successful strategy of discrediting it – here in dictionary entry form, in the entry 'Matériel':

Material also means massive, gross. ... These walls, these foundations are too *material*. This watch is not subtle, it is too *material*. One also says of a witless man, or one who is too fond of the pleasures of the senses, that he is quite *material*, he has a thick and *material* physiognomy (*Dictionnaire de Trévoux* 1704, II, n.p.).

The Enlightenment anti-materialist writer Denesle (no first name known) wrote that "matter was the most vile of all beings"¹⁷; as late as 1873, Doctor Desgrange, as I mentioned earlier, called materialism "the most fearsome enemy of society today." Sometimes this pathos of hatred for matter can, surprisingly, alternate within the same author with a passion for its vitality: Alexander Pope, for instance, exclaimed – quite conventionally – that "There's nought in simple Matter to delight/'Tis the fair Workmanship that takes the Sight," so that "Where Mind is not, there Horror needs must be/For Matter formless, is Deformity," but also, closer to the 'vital' materialism discussed in Chap. 5, insists on matter as inherently *alive*: "All matter quick, and bursting into birth."¹⁸

There would be more to say about this sometimes accidental, sometimes deliberate slippage between the hatred *for matter* and the hatred *for the thinkers who*

¹⁷Denesle (1754), I, 33n.

¹⁸Respectively, Pope (1735), 345 and Pope (1958), Epistle I, section VIII, 44.

'defend' it, but this is not the place. Indeed, in a remarkable display of continuity despite highly diverse intellectual, theological and political contexts, this contempt for 'crude materialism' runs at least as far as the twentieth century, via Hegel, Engels and Sartre. Moreover, it crosses between a 'metaphysical' form of contempt (as in Cudworth, Nicole or the *Dictionnaire de Trévoux* cited above), a more historicized form, which becomes canonical for a certain brand of Marxism, as presented notably by Engels in the late nineteenth century, and which I shall have more to say about in Chaps. 4 and 5, and even a more scholarly form, which we shall encounter again, as part of my aim will be to rebut it: this critique insists that Enlightenment materialism was necessarily a "mechanistic materialism." Here is Engels' canonical statement, which is well-known and cited in papers including mine, but it deserves a place in any attempt to give an introduction to problems in the history of materialism.

The materialism of the past century was predominantly mechanistic, because at that time ... only the science of mechanics ... had reached any sort of completion. ... For the materialists of the eighteenth century, man was a machine. This exclusive application of the standards of mechanics to processes of a chemical and organic nature – in which the laws of mechanics are also valid, but are pushed into the background by other, higher laws – constitutes the specific (and at that time, inevitable) limitation of classical French materialism¹⁹

What I called the 'scholarly' form of this rather overdetermined presentation can be found, e.g., in a description from a study of physical concepts in the *Encyclopédie*, from the 1950s:

the strongest, most pronounced characteristic of the metaphysics we find in the materialism of the 'encyclopédistes', is the reduction of all forms of the motion of matter to mechanical motion, and of all changes in the universe to the merely 'local changes' of a permanently self-identical and unchangeable matter. It is a mechanistic materialism.²⁰

It is a flagrant mistake to describe eighteenth-century French materialism as 'mechanistic', for many reasons that I shall not discuss here (for some elements see Chap. 4), ranging from the specifically organic or organismic focus of works like *L'Homme-Machine* to the quite real obsession with the chemistry of matter in such authors. But the aspect I wish to highlight here does not concern matter theory. Rather, it is the way such analyses frequently appeal to a somewhat unargued-for concept of interiority or selfhood which they oppose to this world of mechanistic matter, as when Suzanne Necker asserts in vulgarized Cartesian language that "half of a self is a contradictory absurdity, just like a parcel of matter that cannot be divided is also a contradiction..." (Necker 1798, III, 88).

¹⁹ Engels (1888), in Marx & Engels (1982), 278 (translation mine); in English in Marx and Engels (1959), 211.

²⁰ Vassails (1951), 315, referring to the article "MOUVEMENT." One could extend this study of the inflated vision of a mechanistic materialism to contemporary theoretical debates at the intersection of feminism and shifts in 'theory' in the humanities, sometimes under the heading of 'new materialism'; I give some indications in Wolfe (2015).

I observe that this contempt (which here presents itself as merely a *constat* of historical limitations) crosses between metaphysics, history of philosophy and scholarship, also because the more strongly normative language we encountered in the seventeenth-century texts cited above somehow returns also in Marxist humanist form, e.g. in Sartre's well-known 1946 essay "Materialism and Revolution." Sartre describes materialism here as "the subjectivity of those who are ashamed of their subjectivity" (Sartre 1990, 99); materialism claims to be all about reason, but within the materialist perspective, reason is "captive, governed from outside, manipulated by blind causal chains" (86). Nature here is "pure externality" (94), purely mechanical (89–90), in sharp contrast with the world of values and action: "a causal chain can lead me to a movement, a behavior but not ... to my grasping of my situation as a totality. It cannot ... account for revolutionary class-consciousness" (120). In sum, materialism is Taylorism: "materialism, by decomposing man into rigorously defined behaviors like in Taylorism, serves the purposes of the master: it is the master who conceives of the slave as being like a machine" (127–128).

Sartreans and critics of what they perceive as the excesses of materialism might not be delighted to be lumped in with old-fashioned humanists, extending intuitions going back to the Cambridge Platonist defense of the soul, and subsequently human dignity. But the above analyses rely on very much the same intuitions as assertions such as "If everything is matter, I cannot see in the name of what, indeed, we might condemn Stalin's work" (this is Mauriac).²¹ What *do* we need to condemn Stalin, then? This takes us back to the responses to La Mettrie, which reveal that the critique of the 'man-machine' idea (which is one way like another of asserting that everything is material) is really a response to *moral* danger. Sade will force this into the form : if everything is matter, I can commit any crime.

Nor is this opposition between a world of meaning, value, and subjectivity and a cold, dead world of matter (and/or mechanistically understood matter) restricted to a now-vanished Hegelian Marxist tradition: a prominent recent work in 'enactivist' cognitive science of recent years declares boldly that "Life is not physical in the standard materialist sense of purely external structure and function ... [w]e accordingly need an expanded notion of the physical to account for the organism or living being" (Thompson 2007, 238), a point of view reflecting an enduring trend in phenomenology.²² In sum, materialism is frequently portrayed as some combination of stupidity and wickedness – "dead matter," "mechanical, lifeless matter," "brutish matter" or – which is not the same, as we shall see – as evil itself, as in Hugo's verse

²¹ Mauriac, note of March 1953, in Mauriac (1967), 433. Thanks to Lucian Petrescu for help with this reference.

²² One thinks also of Husserl's war against positivism, his endless plans to refound each science on an eidetic basis as a science of essences, his rants against laboratories and "experimental fanatics" (Husserl 1910–1911, 304) or the "scientific fanaticism" of our time (338). Whether or not phenomenology can be naturalized (see Varela et al. 1999), it will not be soluble in materialism, as Thompson himself indicates. This did not prevent such major figures of twentieth-century materialism from searching for 'naturalized' equivalents of intentionality, e.g. David Armstrong (Armstrong 1968/1993, 57).

which serves as the epigraph here: “evil is matter itself. Dark tree, fatal fruit,” versus a varying combination of Life, Value and Freedom.

Faced with this situation, some twentieth-century thinkers sought to introduce materialism into the history of philosophy, from Althusser onwards – and one should not confuse this more sophisticated project²³ with the older diktats of ‘dialectical materialism’ or the more dogmatic attempts to present, e.g. Helvétius or Diderot as heroes of a kind of class struggle in philosophy *avant la lettre* (a classic instance of which is Plekhanov 1934). Or one can seek to historicize the practice of the history of philosophy itself, in order to detect its Kantian (and otherwise idealistic) leanings.²⁴ Here my aim is strictly to call attention, in this combined historico-philosophical account, of several *distinctive features* of materialism, both in a comparative manner (when Diderot and J.J.C. Smart seek to explain mental processes by appealing to the brain, what do they share and what is dissimilar in their arguments?) and in a specific context (what can the materialist say about phantom limb syndrome?). This is what I meant above by the need for a typology of forms of materialism.

1.3 Forms of Materialism

Whether it bases itself on a critique of concepts of divinity or an internal reform of theology, on physics, on biology or neuroscience (this is not an exhaustive list!), materialism will hold (i) that everything that exists is material, or the product of interaction between or relations between material entities; a second form of materialism (ii) will focus on relations between mind and brain, although (i) and (ii) are not always separate: from responses to Locke on thinking matter to debates on animal minds in the wake of Bayle’s article “Rorarius,” concerns about the nature of matter and the nature of the mind could fuel one another, as in the chapter title in the free-thinker Boyer d’Argens’ 1737 *La philosophie du bon sens*: “That the Animal Soul is a Proof that Matter can acquire the Faculty of Thought” (Boyer d’Argens 1737, ch. XIV): Indeed, the Abbé Pluquet, in his eighteenth-century catalogue of heresies, explains that the thinkers he calls “Materialists or Materials” (*Matérialistes ou Matériels*, a terminology he attributes to Tertullian!) believe “that the soul is born of matter (*sortait du sein de la matière*).”²⁵ The entry on “Materialists (Atheists)” in the revolutionary-era *Encyclopédie méthodique* distinguished between variants of

²³Jean-Claude Bourdin’s reading of Hegel on materialism, but also of the challenging presence of what we might call ‘Radical Enlightenment’ materialism within Hegel’s historical presentation of philosophy, is a noteworthy attempt in this regard (Bourdin 1992).

²⁴See Haakonssen 2006 and the papers collected in Laerke, Schliesser Smith eds. (2013), particularly those by Smith and Vermeir.

²⁵Pluquet (1762/1788), II, s.v. “Matérialistes,” 300. As late as the *Encyclopédie* article “Matérialistes,” these are presented (with an acknowledgment that it is an old definition) as those thinkers “who claim that man’s soul is matter” (Diderot 1765/1966, X, 188b), thus combining theses (1) and (2).

(i) and (ii), but observed that they are often collapsed: “*materialists* argue either that man’s soul is matter, or that matter is eternal and is God; or that God is just a universal soul distributed throughout matter which moves and arranges it, either to produce beings or to create the various arrangements we see throughout the universe” (Naigeon (ed.) 1794, III, 208).

Claim (i) often took the form of a ‘cosmological’ thesis – i.e., concerning the constitution of the universe as a whole, as in d’Holbach’s affirmation, “the universe, this vast sum of all that exists, offers us everywhere just matter and motion,” in the first section of his *Système de la nature* (d’Holbach 1770, I, ch. I, 44). The cosmological thesis was initially framed as an attribution of basic properties such as motion to matter. Thus, in the early years of the eighteenth century, the Irish deist and free-thinker John Toland rejected – perhaps the first to do so – the strong distinction between matter and motion: “Matter is but Motion under a certain Consideration” (Toland 1704, C 4). The fifth of his *Letters to Serena* (*ibid.*, 163f.) is explicitly entitled *Motion essential to Matter*, and in it Toland states that “All the Matter in Nature, every Part and Parcel of it, has bin ever in motion, and can never be otherwise” (167), and “there’s but one sort of Matter in the Universe” (174). In addition – as La Mettrie and Diderot emphasized more dramatically – matter is not just in some sort of ‘intestine’ motion (Toland speaks later on of its “autokinesy”), it is also fundamentally, inherently *active*: “Activity ought to enter into the Definition of Matter, it ought likewise to express the Essence thereof” (165), “action is essential to Matter” (160). Contrary to the common accusation that materialists reduce the world, life and mind to a heap of dead, passive matter, Toland is explicit that “Matter neither ever was nor ever can be a sluggish, dead and inactive Lump, or in a state of absolute repose” (C 3); “I deny that Matter is or ever was an inactive dead Lump in absolute Repose, a lazy and unwieldy thing” (159).

However, it is not as if materialism progresses by simply adding further and further properties to Galilean or Cartesian extension like layers in a *millefeuille*. Indeed, active matter, or thinking, sensing, living matter was a consequence of criticisms of the Cartesian/Malebranchian notion of inert matter and theory of mechanism that went with it. As Diderot put it, reacting to the classic mechanist metaphor of the watch or clock in his unfinished *Elements of Physiology* (written during the later 1760s and 1770s), “What a difference there is, between a sensing, living watch and a golden, iron, silver or copper watch!” (Diderot 1975-, XVII, 335). The key property of living matter was organic sensitivity. Diderot sometimes suggested that “sensitivity or touch is common to all beings,” or even that sensitivity was a “general property of matter” (308).

In this context, matter was not a metaphysical *extensa* to be assumed in theory, but instead open to experimental investigation into the particular properties of distinct types of living matter – the plasticity of the cerebellum or the regenerative properties of Trembley’s polyp or, frequently appealed to by medical materialists including Mandeville (1711/1730) and La Mettrie, the particular illnesses of patients and their relation to individual constitutions – all of which served as evidence of the sorts of properties and powers possessed by matter. A virtue of these theories is that they drew on working experimental concepts and situated their arguments within

experimental contexts, not solely within a theoretical account of how exemplary science works. Diderot, whose matter theory centered on epigenetic, living, sensing, self-transforming matter, stated this point as a chemically motivated critique of mathematical abstraction, in his 1770 *Principes philosophiques sur la matière et le mouvement*:

You can practice geometry and metaphysics as much as you like; but I, who am a physicist and a chemist, who takes bodies in nature and not in my mind, I see them as existing, various, bearing properties and actions, as agitated in the universe as they are in the laboratory where if a spark is in the proximity of three combined molecules of saltpeter, carbon and sulfur, a necessary explosion will ensue (Diderot 1975-, XVII, 34).

More broadly, he opposed the novelty and conceptual significance of the life sciences to what he (incorrectly) judged to be the historical stagnation of mathematics, including as in his *Pensées sur l'interprétation de la nature* (discussed in Chap. 4).²⁶ What is notable in this attitude is the effort to conceptualize a new ontology for the emerging life sciences as part and parcel of the reduction. This was very different from both the mechanistic models of Life and the 'animist' appeals to the soul as an explanatory or even genuine ontological principle (as in Georg-Ernest Stahl) in the late seventeenth and early eighteenth centuries, which either failed to account for specifically living, goal-directed features of organisms, or accounted for them in supernaturalistic terms.

There are several ways to describe this increasing complexity in matter theory. One reading emphasizes the shift from substance dualism to a theory in which matter takes on some of the explanatory role that 'soul' had previously (Vartanian 1982; Wright 1991). The entire story that this book seeks to tell, could be retold in terms of shifting concepts of the soul – its mortality, its corporeality, the possibility of its naturalization, tensions between Aristotelian and Epicurean models, the appearance of animal spirits on the scene, and so on. That will have to wait for another book, but I should like to make one observation, concerning the status of a 'hegemonic' entity corresponding to a centre of our personhood (self, subject, person, soul ..., which Cudworth describes in his writings on morality as the *to hegemonikon*).

The fear that 'cosmic' materialism would lead to reductionist approaches to the mind (and thus the self, the person ...) was central to early modern physico-theology and beyond, from the Boyle Lectures which Robert Boyle had endowed in his will (the title of Richard Bentley's second Boyle Lecture for 1692 is quite explicit: *Matter and Motion Cannot Think*) and John Ray's *Wisdom of God* in the 1690s to Bernard Nieuwentijt's *The religious philosopher, or, The right use of contemplating the works of the Creator* (1715; first English translation 1719), and William Paley's *Natural Theology* of 1802. This is why Isaac Newton was so adamant that gravity should not be understood as a property of matter:

²⁶Diderot (1753), § 4 in Diderot (1975-), IX, 30–31.

It is inconceivable that inanimate brute Matter should, without the Mediation of something else, which is not material, operate upon, and affect other Matter without mutual Contact, as it must be, if Gravitation in the Sense of *Epicurus*, be essential and inherent in it.²⁷

Thus he wrote to his ideological protégé the divine Richard Bentley that he “desired you would not ascribe innate Gravity to me”:

That Gravity should be innate, inherent and essential to Matter, so that one Body may act upon another at a Distance thro’ a *Vacuum*, without the Mediation of any thing else ... is to me so great an Absurdity, that I believe no Man who has in philosophical Matters a competent Faculty of thinking, can ever fall into it (*ibid.*).

But quickly, the issue shifted from the attribution of motion or gravity to matter, to a yet more grievous attribution, shifting imperceptibly into materialist claim (ii), concerning *thought*. No one saw or expressed this more clearly than Fontenelle, the longtime Secretary of the Académie des Sciences, in his 1752 *Théorie des tourbillons cartésiens* (*Theory of Cartesian Vortices*), late in his long career and life. Fontenelle reflected critically on what he saw as the arbitrariness of Newtonian attraction, and added that attributing attraction to matter in terms of God’s will (“wholly arbitrary”) was a small step away from granting it the power to think: “If we grant this arbitrariness, we destroy any philosophical proof of the spirituality of the soul. *God could just as well have granted thought to matter, as attraction*” (Fontenelle 1752, § III, in Fontenelle 1829, 71, emphasis mine).

The most celebrated discussion of matter and thought in the early eighteenth-century was the pamphlet exchange known as the Clarke–Collins correspondence. Briefly, Samuel Clarke had sought to prove in his *Letter to Dodwell* that consciousness cannot be the property of a system of material parts. According to Clarke, a material thing was divisible. An individual consciousness must be indivisible (“indiscerptible”) and hence immaterial and immortal. Anthony Collins responded that a divisible system of matter taken as a whole may have a quality not equal to the sum of the qualities of the separate parts (Clarke 1738, III, 769): a rose is a divisible thing, yet its smell cannot be reduced to the sum of the powers of the parts²⁸ – and thinking might be like this, too. While consciousness, thought, or the rose’s smell may not be the properties of individual parts of these respective systems, they are properties of the whole.

For Clarke, if matter were conscious, then every particle of matter would have a distinct indivisible consciousness. A system of matter made up of such particles, could not have an individual consciousness, but would have to be at best a cluster or bundle of consciousnesses. Collins replied that Clarke just assumed that thinking was an individual power. For Collins, *thinking was a mode of matter*: “human consciousness or thinking is a mode of some generical power in matter ... it has

²⁷Newton to Bentley, February 25th, 1693, letter III in Newton (1958), 302. He adds that “Gravity must be caused by an Agent acting constantly according to certain Laws; but whether this Agent be material or immaterial, I have left to the Consideration of my Readers.” For a stimulating analysis of the metaphysics involved in Newton’s discussion of gravity, see Schliesser (2011).

²⁸Collins, in Clarke 1738, III, 770 (this controverts Clarke, *Letter to Dodwell*, in Clarke 1738, III, 759).

generation, succession and corruption like all other modes of matter” (in Clarke 1738, III, 807). Collins further insisted on a connection between the empiricist account of the origin of ideas in sensation, and the materialist account of how “ideas of sensation” originate in the process of “bodies operat[ing] upon us” (Clarke 1738, III, 863). Here, Collins added the other characteristic (and at the time quite new) materialist claim that thinking is a kind of motion in the brain (866).

If Cudworth and Bentley had feared the idea that matter could *think*, by the mid-eighteenth century the fear is primarily directed towards *living*, self-subsisting, self-organizing matter. Kant, in the 1786 *Metaphysische Anfangsgründe der Naturwissenschaft* (*Metaphysical Foundations of Natural Science*) and subsequently, argued at length against this view, which he called hylozoism, and sought to eliminate its possibility from our concepts of nature; he viewed it as “the death of all philosophy of nature.”²⁹ Consider also Goethe’s reaction to d’Holbach’s *System of Nature*:

I recollect particularly the *Système de la Nature*, which we laid hold of with curiosity. We could not understand how such a book could be dangerous. It seemed to us so gloomy, so Cimmerian, so deathly (*so grau, so cimmerisch, so totenhaft*), that we could hardly endure its presence, and shuddered before it as before an apparition.... But how vacant and desolate our souls grew in this sad atheistic twilight (*tristen atheistischen Halbnacht*)! – in which the earth vanished with all its forms of beauty, and the heaven with all its stars. Only matter remained, moved from eternity hither and thither, right and left, with no other power, on all sides producing the endless phenomena of existence (*Dichtung Und Wahrheit*, XI, in Goethe 1887–1919, 69–70).

Goethe is describing a reaction that was also common in Coleridge and other authors who were deeply invested in the philosophy of nature: that materialism was a dehumanizing form of reduction that stripped Nature of life and meaning; he missed the stress on living, self-organized matter and the criticisms of mechanism in French materialism (and differently, in Collins and others), which were meant to supersede the dichotomy between inert matter and active thought.

Engels, Ruyer and already Goethe articulate a powerful (at least at the level of intuition) critique of materialism: that it reduces the world of life to the world of dead matter; a sophisticated version of this critique would allow for the pertinence of certain sciences (from the search for the *Urpflanz* to an Aristotelian biology!) *over and against* other, illegitimate explanations, e.g. in terms of physics and/or mechanics. They seem blind to the presence, in Lucretius, Gassendi, La Mettrie and Diderot, and in a very different way in authors such as Dewey, Quine or Dennett, of either a specifically *vital* sense of matter, and/or a naturalistic openness to the fact that the description of the natural world is not, in the end, going to be a matter of pure physics. One could add, as I discuss further in the Conclusion, that they don’t seem to do justice to the very active forms of *anti-foundationalism* in work in the theories they attack (or perhaps it is their desire for ultimate foundations which

²⁹ *Metaphysische Anfangsgründe*, III.3, AA 4, 544. Prior to the first *Critique*, in a 1773 letter to Marcus Herz, Kant already insisted that in his anthropology lectures he would avoid “eternally futile inquiries as to the manner in which bodily organs are connected with thought” (AA 10, 145), as opposed to what he would call pragmatic anthropology.

motivates some of their criticism!). As the anonymous 1738 *Dissertation on the Formation of the World* put it, “isn’t it in vain that we seek to define the original form of matter?” (ch. II, in Stancati 2001, 96). A variety of texts, from Meslier’s *Mémoire* (written in the 1720s but unknown until a generation later) to the *Encyclopédie* article “Matière,” speak out against “first principles.” The materialist will precisely reject the foundational character of mind, as in Cudworth’s formulation that mind is “senior to the world” (Cudworth 1678, I, ch. IV, 729, 736–737; ch. V, 853).

* * *

I have suggested some ways of sorting out through the morass of the history of materialism without thereby opting either for an overly partisan defence of a kind of eternal truth (scientific? metaphysical? atheistic?) of this doctrine, or for an antiquarian *herbier* of endless possible cases, sources, rhetorical forms and instantiations. Unfortunately, many episodes were left out, as I discuss again in the Conclusion – and even if this study were double the length, it would still not be about dialectical materialism or materiality. But I hope that a short historical and philosophical overview which combines Aristotle contra materialism, the problem of phantom limbs, evolution (however briefly, in Chap. 3), brains, machines and ‘hylophobia’ will serve some purpose. Scholars of early modern philosophy will wish for chapters on Hobbes, Spinoza, perhaps Cavendish,³⁰ or Leibniz’s critique of materialism/Epicureanism; scholars of German Idealism will regret the absence of the problem of hylozoism, determinism, abstract matter, and so forth. This is, of course, a partial introduction, ‘heavy’ on the Enlightenment and its posterity.

Methodologically, the trajectory I have sought to describe indicates that there is a history, not just of materialist philosophies (e.g. Lucretius, Hobbes, Diderot, Priestley) but also of the presence of materialist ‘components’ or articulated wholes *within* philosophical systems that are not themselves materialistic: Descartes as appropriated by Regius, Malebranche as appropriated by *L’âme matérielle*, Spinoza and Bayle as appropriated by several generations of radical eighteenth-century thinkers – not to mention ‘scientific’ texts like those of Willis, Whytt or Haller, whose authors go out of their way to reject materialism, but who instantly become evidence for that view. (I don’t take a position in this work on whether Spinoza was a materialist or not.³¹) This is not just a theoretical game (whether it is described as collage, appropriation or in more systematic terms), for as noted with respect to Malebranche’s psychophysiology, sometimes the texts which were criticising a view could serve as the best evidential resource for an author who was not part of an inner sanctum of experimental natural philosophy.³²

³⁰ See the work of Stewart Duncan, e.g. Duncan (2012).

³¹ Although I am sympathetic to this view. See Moreau (2000) and Korichi (2000).

³² Thus Diderot, writing on physiology, could cite as evidence the Edinburgh physician Robert Whytt’s ‘neuropsychological’ assertion that “the soul is equally present in the extremities of the nerves through the whole body as in the brain” (Whytt 1768, 287) even though Whytt had specified this was not tantamount to materialism, since these functions of the soul were themselves depen-

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dent on what he calls an “active sentient principle,” which brought together sensibility and life, and could not be a property of matter itself (*ibid.*, 128).

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Chapter 2

To Be Is to Be for the Sake of Something: Aristotle's Arguments with Materialism

We must embark on the investigation of each animal without aversion, since there is in all of them something natural and beautiful. For the non-random, the for-the-sake-of-something, is present in the works or functions of nature most of all, and the end for the sake of which they are constituted or have come to be has the status of the beautiful (PA I 5, 645a21-26).

Abstract There are many ‘idealist’ critiques of materialism, including as a natural philosophy. Early modern critiques often invoke a notion of ‘soul’ or ‘life’ as a feature which the materialist either eliminates, or at least cannot account for. Here I examine an early and powerful critique of materialism in Aristotle, which brings out both his subtlety with regard to the nature of biological entities and, perhaps, his desire to find a ‘third way’ between the pure idealism of Platonic forms and the equally pure chance-and-necessity of the atomists, who he calls the *phusiologoi*.

2.1 Introduction

Aristotle presents various arguments against thinkers he calls the *phusiologoi*, which we might rephrase today as the ‘materialists’. In his view, the concern that thinkers such as Democritus or Empedocles exhibited with matter led them to reduce everything either to atoms-and-chance, or to a theory of elements (fire, earth, water, air) and their ‘mixture’, so that they “hardly touched on form or essence” (*Phys.* II 2, 194a20). However, Aristotle is equally critical of the ‘idealism’ of the Platonic forms, which do not explain characteristic phenomena of the sublunar realm such as *change*: “Forms are of no great use in the generation and the substances of things” (*Met.* Z 8, 1033b29), or more generally, “why did things participate in the Forms or do so now?” (*Λ* 10, 1075b20). His way of navigating a path in between these two extremes, one which does attempt to provide ‘explanations’ or ‘formulae’ for the natural world, but cannot account for the permanence of things, since it constantly invokes chance and necessity, and the other which is too far removed from the world, is, I shall argue, expressed best with his notion of ‘for the

sake of'.¹ From the general account of change we get to the principle that can be stated as:

X is neither best explained by its constituents; by a chance occurrence; or by its *eidōs*. Rather, X is best explained as being 'for the sake of Y'. To be is to be for the sake of something.

Therefore my analysis of Aristotle as an 'anti-materialist', or as a thinker in dialogue with the materialist challenge, will focus on his development of this theme as a response to materialism. As his biological writings show, the investigation of nature will reveal that the 'for the sake of' is present there more than anywhere else, in an argument which brings biology and metaphysics together. Further, Aristotle applies the notion of 'for the sake of' to an analysis of matter itself, in which the material account of organic functioning is not so much denied, as it was in the case of natural processes such as teeth growth or rainfall, as integrated into a teleological account. So-called anti-materialist arguments emerge in Aristotle because he wants to protect his theory of change from collapsing into a theory of chance (a non-theory, in his view). Hence I will first (Sect. 2.2) try and reconstruct the steps by which he arrives at this problem: from reflections on form and matter to change and generation. Next, and centrally (Sect. 2.3), I will focus on Aristotle's arguments for the 'for the sake of' or final cause, both as regards natural processes and animate matter itself. These arguments are the first expression of the distinction between teleology and necessity, since it is in reaction to theories of chance and necessity, e.g. in *Physics* II, that Aristotle first articulates the 'for the sake of'. I conclude (Sect. 2.4) with some further reflections on the 'for the sake of', scientific explanation, and the Good.

2.2 A Biologistic Metaphysics: From Form and Matter to Change and Generation

2.2.1 Why Do We Need Functional Explanations?

Aristotle takes as his starting-point the "assumption" that there is change in nature (*Phys.* I 2, 185a12), something he assumes so as to not get caught up in what we might call the 'rational metaphysics' of his predecessors. Further, natural things have a principle of "change" or "motion" (*kinesis*) within them, unlike artefacts. This is what it means to be natural, to "have a nature" (*Phys.* II 1, 192b14-15, b33). Put differently, the "nature" of a thing is the 'principle of change' within it (*Met.* Δ 4, 1015a13-19). Now, there are different kinds of change. To explain them we need the four causes, since to know a thing is to know its cause or explanation (causal

¹*Eneka* or *to hou eneka*.

explanations are literally *aitiologiais*).² I won't rehearse Aristotle's analysis of the four causes here, but suffice it to say that he places emphasis on substance or essence (*to ti ēn einai*, 'what it is' for something to be that something), the "why" or "formula" or "pattern," i.e. the formal cause, and that 'for the sake of which' (*to hou heneka*) something is undertaken, namely its final cause.³ Given that the chief issue here is materialism, I emphasize that what he calls the "source which begins motion," the source of change, i.e., the *efficient cause*, comes closest to our modern understanding of causality (and many of the early modern natural philosophers promoted the efficient cause to first rank). Aristotle thinks that the *phusiologoi* rely on efficient causes, or a combination of material and efficient causes, to explain phenomena which he would explain with reference to final causes (*Met.* A 4, 985a10-13, a27-34; "past *phusiologoi* [who ...] only saw material and efficient causes"; *GA* V 1, 778b7). A genuinely causal explanation for Aristotle is precisely not an 'inert' materialist explanation, since a cause is a source of motion.⁴

The pre-Socratics tended to rely on *material* causes (b), but wood does not 'make' or cause the bed,⁵ nor bronze the statue! Aristotle is neither interested in material constituents, nor in Platonic forms; he wants to find the X which is the source of *motion*. After reviewing the pre-Socratics and their claims about fire, earth, air and water, Aristotle asks: is the only cause material? (*Met.* A 3, 984a18). His answer is No, which leads him to the initial formulation of his anti-materialist position: "For, indeed, the underlying subject itself does not cause itself to change" (a23, emphasis mine). Matter does not *move itself* (Λ 6, 1071b29), it cannot be a source of motion: the house requires an architect to exist. Aristotle's reflection on the substratum (*hupokeimenon*) leads him to develop a theory of *form and matter*, in contradistinction to the Platonic Forms which explain nothing of the world as we experience it; this theory is entirely focused on the problem of *change*, which he wants to grant its 'lettres de noblesse' as a metaphysical problem. How can the form subsist, if the matter changes? Conversely, how is it that if we bury a wooden bed, it behaves like 'wood' rather than like a bed? To begin an inquiry into what is, into the causes that produce the world as we know it, Aristotle has to start from existing things, as perceived by the senses. Initially, two questions can be asked about each thing: (i) the 'what' question, i.e. what are its constituents or components? And (ii) the 'how' question, i.e. how did it come to be this way? These two questions ultimately are replaced by a third: (iii) what is the thing *for*?

The answer to (i) concerns form and matter, and (ii) is fundamentally what pushes Aristotle to address the problem of change, to which he responds with the notions of potentiality and actuality. The same object can exist as actuality or as

²*Met.* A 1, 981a30; A 3, 983a25-26; *Phys.* I 1, 184a13 and II 3, 194b19-21. On the four causes in general, *Met.* A 3 refers to the canonical discussion in *Phys.* II 3, which is in turn partially duplicated in *Met.* Δ 2.

³Aristotle provides an account of the 'for the sake of' as an explanation of natural processes in *Phys.* II 8 and *PA* I 1 (both of which I discuss in part II).

⁴*Met.* A 3, 984b19, b23, b26-27, and *Phys.* II 8, *passim*.

⁵*Phys.* II 1, 193a13-b9.

potentiality, since the form and the composite are actual while the matter is potential (Λ 5, 1071a5-11). Matter exists potentially until it is informed by a form (Θ 8, 1050a15). Actuality must be first (as cause of all, Λ 5, 1071a38) since if there were only potentiality, how could there be motion? (Again, matter does not move itself.) Potentiality is *for the sake of* actuality (Θ 8, 1050a9) — moving towards question (iii). And we know what the highest actuality is: the Prime Mover, the ultimate final cause.

The explanatory challenge of change leads Aristotle to write the *Physics*, in which change is defined as a kind of motion. But precisely since motion has to come from somewhere, there will be a science of “first principles”: *philosophia prote* or first philosophy, precisely, the branch of theoretical activity concerned with first principles or causes (which include the good, or final cause: *Met.* A 2, 982b10). First philosophy studies immaterial, unchangeable substances, ultimately the Prime Mover; ‘second philosophy’ divides into the study of substances which are changeable but eternal, namely heavenly bodies, and perishable substances in the sub-lunar realm, such as biological entities.⁶

The need for an explanation of change leads to the notion of a substratum, a level ‘beneath’ the change, because Aristotle requires an explanation of natural processes which can appeal to a genuine ground and not just be caught up in accidents: this would be materialism. The situation as he presents it is that all of his predecessors got stuck positing principles and then asserting their mixture or conflict; “no one states why there will always be generation and what is the cause of generation” (*Met.* Λ 10, 1075b17); the materialists believe that nothing is generated and nothing perishes (A 3, 983b14) because the basic ‘stuff’ is always being preserved. To take change ‘seriously’ means not hypostatizing it as a constant flux of becoming, as Heraclitus does. Aristotle explains that Plato, in his youth, was still a Heraclitean who explained everything in terms of change; it was the encounter with Socrates, who was in pursuit of universals with his ‘what is X?’ questions, that convinced Plato to look for something beyond the sensible realm: the Forms (*Met.* A 5–6, 987a30-b10). But the Forms are not a good enough account of change, of the changing world we experience, including processes of generation, which are shown to be a problem in *Phys.* I, 7. In contrast, materialists are ‘better’ than mythological thinkers such as “Hesiod and the theologians” (*Met.* B 4, 1000a10), since they at least “proceed by demonstration” (a20). Yet in the Empedoclean account, change is not real either, but rather an “accident of interrelations between the real things”⁷; the true process of generation, namely, coming-to-be and passing away, is treated as appearances corresponding to qualitative redistributions.

However, change as the ‘target’ of explanation is not *reduced* to an inert substratum. Rather, Aristotle emphasizes the idea of the *source which begins motion*. Materialists such as Leucippus, Democritus and Empedocles confuse the material cause with the “moving cause,” the source of motion. Thereby they are guilty of the

⁶ *Phys.* II 7, 198a30; *Met.* E 1, 1026a29-31.

⁷ Graham (1990), 125.

same lacuna as the ‘idealists’ such as Parmenides, for whom all is One: they “casually neglect” motion (*Met.* A 4, 985b20).

The problem is how to deal with sensible substance, i.e., changeable substance. Matter as correlate of form initially emerged as a philosophical response to the problem of change. Instead of understanding change as the shift from one contrary to another, Aristotle argues that there must be a substratum underlying the changes, which can also explain the generation and corruption of substances. This substratum turns out to be matter (*Phys.* I 9, 192a31-32, 34)—except ultimately he will decide that it is form. It’s not the matter which ensures the persistence of identity over time,⁸ since it is entirely replaced. Rather, the substantial form has to be incarnated in a “distinct matter,” as mentioned at *Met.* H 2. That which endures is *for the sake of something*, a principle sometimes termed Aristotle’s ‘functionalism’.

2.2.2 Functionalism

Functionalism, which asserts that what something *is*, is what it is *for*, brings us back to the ‘for the sake of’. A passage at *Phys.* II 9 (200a31f.) explains this well: the necessary in natural things is both the matter and the changes it undergoes; the student of nature has to treat both causes, but particularly what the thing is for, since that is “responsible for the matter, whereas the matter is not responsible for the end” (a30-34). Indeed, more violently, Aristotle will sometimes say that the more matter there is, the harder it is to make out the end.

In *DA* I 1, 403a29-b3, Aristotle distinguishes between the way the materialist philosopher (*ho phusikos*) would deal with, e.g., the problem of anger, as opposed to the dialectical philosopher (*ho dialektikos*). The materialist explains the phenomenon by reference to the “boiling of the blood,” while the “dialectician” appeals to “the form or account” (*to eidos kai ton logon*), that is, the directionality of the behavior: what is anger *for*? Anger is a *desire to do X*. But Aristotle does not completely identify himself with the dialectical view, even though it seems to resemble his own, thus expressed. In fact, as we might expect if we remember his fondness for the ‘middle way’ or ‘third way’, instead of either the materialist or the idealistic interpretations of the phenomenon, Aristotle says that the proper account must *combine the material and the formal* (403b7-9).⁹ If this sounds at all mysterious, let us take one of his celebrated examples ... which may reveal that the ‘hylomorphic’ third way is nonetheless slanted towards form-as-function.

On the one hand, wood does not make a bed, because a bed *qua* bed has no innate principle of change or motion, i.e., it does not have a nature, the wood has a nature. A bed has “acquired the characteristics” which make it a bed, by being an artifact, and thus has no ‘nature’. As Aristotle adds later on, “those things are natural which by continuous motion originate from an internal principle and arrive at some end”

⁸Loux (1991), 234.

⁹Cf. Berti (1996), 128–129.

(*Phys.* II 8, 199b15). Only insofar as it is made of wood does the bed have a principle of change (II 1, 192b29) which causes it to sprout if buried (193a14, b9). The *ousia* of the bed is indeed its matter, whereas its “formed” features (whether it is a bunk bed, a bed purchased at Ikea, a futon bed ...) are contingent. Hence some thinkers have wanted to restrict “reality” to the four elements, in the sense of ‘what there is’: Fire, Earth, Water, Air. But on the other hand, and more definitively, a bed, or a body part, is not defined by its matter but by its form, or at least by “the matter of the composite” (*PA* I 1, 640b26), since “there are two sorts of thing called nature, form and matter” (*Phys.* II 2, 194a12) and “the form has a better claim than the matter to be called nature” (II 1, 193b6-7). Aristotle’s reply to the fact that the wood of the bed sprouts is his famous “men come to be from men” (193b8-10), that is, men are not born by accident. The matter called ‘wood’ does not make the ‘formed’ entity called ‘bed’ because “the arrangement by virtue of which such matter constitutes a bed is an accidental attribute of it.”¹⁰ Insofar as it is a bed (with a definition, a *λόγος*, a blueprint), the bed is not “wood” but “wooden.” When we see such a bed, we don’t see ‘Look, there is some wood’ (unless we are looking for some with which to make a fire), but rather ‘there is a (wooden) bed’.

Change and alteration seem to force *any* account of substance to include an account of sensible substances. If one excludes ‘cosmic’ motion (the motion of the heavenly bodies), “living creatures are responsible for the motion of everything else,” except motion due to immediate contact such as shock. And the distinguishing feature of animal motion is that it occurs *for the sake of something*, both insofar as the animal *is moved* and insofar as it *imparts motion* (*MA* VI, 700b11-12). We are then in the province of natural teleology as discussed in *Phys.* II: the “for the sake of which” and the insistence that final causality belongs to the form. In this context, the sense of matter changes. It is no longer an abstract substratum, but rather the ‘raw matter’ or ‘stuff’ which the form makes of use of to reach its goal (e.g. in generation).

2.2.3 *Chance*

What does a hylomorphic theory of change do faced with the phenomenon of ‘chance’ or ‘luck’ (τύχη), that is, of occurrences which do not seem to obey a pattern? What about the materialist position on change? We recall that the idealists simply fail to address it, or they hypostatize it, like Heraclitus, but the materialist response seems to create more of a difficulty for Aristotle. Thinkers like Democritus and Empedocles assert either that all is necessity, in which case change is denied (Aristotle feels that the phenomena of generation, such as the ‘change’ from a seed into a man, are sufficient counter-evidence for this), or all is chance, all is randomness: in this case there is a blindness to the existence of order and to the fact that ‘a man comes to be from a man’, not from a random assemblage of molecules which,

¹⁰ Kosman (1987), 370, referring to *Phys.* II 1, 193a12-15.

in Lucretius' phrase, is 'now here, now there' (*nunc huc, nunc illuc*; *De rerum natura* II, 131 – a motif which is also crucial in the anti-foundationalist, anti-essentialist reflections of the late Althusser, writing on the materialism of 'chance encounters of atoms': Bourdin 2000). To put it in a quick formula, *chance/necessity is the phenomenon by which Aristotle first truly confronts the materialist challenge*.

He is forced to do since, as he notes, thinkers have been willing to count chance and "spontaneity" ['the automatic', *automatou*] among the *causes* (*Phys.* II 4, 195b33). Now, since natural beings manifest goodness and beauty, they cannot have come to be by "spontaneity or chance."¹¹ Natural processes are *spontaneous* in the sense that they are not 'by chance', but nor are they the products of *voûs*. The 'chance explanation' (accident, coincidence, etc.) is plausible, but cannot be true: "Organic development is either for the sake of something or by chance; it is not by chance (since chance outcomes are irregular, organic outcomes regular); therefore organic development is for the sake of something" (*Phys.* II 8, 198b34-199b7). This can be summarized as follows:

- P1. something is either for the sake of something or by chance;
- P2. since that something can be frequently observed, it is not by chance;

therefore,

- C. it is for the sake of something.

Aristotle relies on his notion of accident, which gives him the basis to deal with the phenomena of 'chance', as either a form of change or, as accident (*Phys.* II 5, 196b10-197a21).¹² Further, accidents are explainable with reference to his distinction between independent and dependent entities: that which exists accidentally presupposes the existence of that which exists in and of itself (with its own internal principle of motion). The universe cannot be a product of chance since accidents are posterior to *voûs* and nature. In fact, chance and spontaneity *imply the existence of a final cause*.¹³ Finally, order is *good*, although less good than the Prime Mover itself, which, as pure actuality, reminds us that everything is ultimately ordered 'towards' actuality, since potentiality is for the sake of actuality (Θ 8, 1050a7-10).

To recapitulate, the problem of change leads Aristotle to focus on the nature of the substratum. This substratum can be either form, matter, or the composite of both. The last option proves most useful for explaining 'generative change', e.g. from a seed to a man. But in the process of articulating this kind of change, namely generation, Aristotle is led by the very 'directionality' of the physical world to

¹¹ *Met.* A 7 (984b11-15). Barnes: "spontaneity and luck"; Apostle: "chance or luck" ('spontaneity' is the same as the more literal 'automatic'); at *Phys.* II 6, 197b51, Aristotle notes that 'spontaneity' is a wider notion than chance.

¹² When Aristotle criticizes materialist theories of chance outcomes, the language and examples he uses, such as arriving earlier or later than planned, and thus being able to settle a debt, or save someone from the situation they are in, are quite close to his definition of accident (*Met.* Δ 30, 1025a15f.).

¹³ Respectively, *Phys.* II 6, 198a5, a10-13; *Met.* K 8, 1065b4; *Phys.* II 4, 196a24-b5, II 5, 197a5-9, *Met.* A 4, 984b14-18.

develop a notion of 'for the sake of'. Put in more familiar metaphysical terms, just because matter as such is abstract or unknowable is not the end of the story: all matter is potentiality for some actuality. The twofold character of matter is to be both part of a 'this' and 'matter for X'. The agent brings about a certain change in the matter which results in the 'form', through motion, including the special kinds of motion called generation and corruption. Now, the ultimate source of motion is the Prime and Unmoved Mover, and all potential strives towards this ultimate actuality. Thus, moving back down to more a mundane level, all action is 'for the sake of' a goal.

Aristotle doesn't ask, 'why is there something rather than nothing?', or 'what are the ultimate constituents of reality?'; they are both *given*. The real question is, why are these materials (this wood), a house? Why is a body in this state, a man? (*Met. Z* 17, 1041b4-9). Aristotle's biology is one which looks at an animal, organ, or other substance and tries to understand what it is *for*.¹⁴ The definition of 'for the sake of', of final cause, is important, because it also conditions the question of *how Aristotle approaches natural processes*. Instead of beginning as a non-theoretical, empirical, 'quantitative' gatherer of examples, he defends the existence of 'what is eternal in what is passing', of regularity as the persistence of form; he approaches natural processes *with an already developed notion of final causality*, in other words as the holder of a substantialist metaphysical theory.

In both the more metaphysical and the more biological versions of the argument, the primacy of form as ground of regularity, and by extension the explanation of natural processes as occurring for the sake of something which ultimately is a source of permanence, serve as Aristotle's basis for denying the 'accidentalism' he finds to be characteristic of materialist thought.

In Aristotle's view, the materialists (1) rely on the idea of chance occurrences to explain the structure of natural beings (e.g. the backbone, which is curved due to a breakage of the spine 'earlier in human history', *PA* I 1, 640a20), and (2) equate material explanations with necessity (640b5, b10). His reply is that it is not enough to say what a thing is made up of. His 'third way', the combination of the formal and the material, is to bring together the material level of explanation, "necessity," with explanations that invoke the "for the sake of which" (642a1, a14, 2a6). What is not entirely clear is how compatible or complementary, necessity and teleology are. He is willing to say that "all natural processes are necessary, it is true, but yet they are for a final cause" (*GA* V 8, 789b3), and moreover, that the "necessary results of material nature" can be "employed by rational nature for a final cause" (*PA* III 2, 663b23).

¹⁴Grene (1963) defends this as a valid 'Aristotelian' understanding of 'the job of the biologist', as opposed to a reductionist program (134, 140, 255). An interesting rebuttal of this view is to be found in Graham (1986). For my criticisms of some forms of holism/organicism in biological theory, see Wolfe (2014a).

2.3 'For the Sake Of' Against Materialism

2.3.1 *Nature as 'For the Sake Of'*

Aristotle addresses the materialist theory of chance in *Phys.* II 8 and *PA* I 1, as an *explanation of nature*. Recall that unlike the idealists, Democritus and Empedocles are the first, in Aristotle's view, to formulate explanatory claims that he can evaluate (even if he ultimately feels obliged to disqualify them). So I want to focus on his rebuttal of the materialists, i.e., his assertion of final causality in nature: Nature is "among the causes that are for the sake of something" (*Phys.* II 8, 198b10); it is always "growing into something," but something *regular*. The study of motion in the sublunar realm reveals that, while it is less perfect than celestial motion, it is nonetheless for the sake of something, and thus it is both regular and *stable*: a man begets a man and not something different.

In *Phys.* II 1, Aristotle defines nature as the principle or cause of motion and rest of the things that have such a principle in themselves (192b22-23); in *Parts of Animals* he equates nature with a *telos* towards which motion tends in order to accomplish it:

whenever there is plainly some final end, to which a motion tends should nothing stand in the way, we always say that the one is for the sake of the other; and from this it is evident that there must be something of the kind, corresponding to what we call nature (*PA* I 1, 641b24-28).

In subsequent paragraphs of *Phys.* II, Aristotle proceeds to lay out an alternative to the view of nature and its principles he has been discussing in the prior chapters of both Books I and II: a materialist account (198b18-33). Aristotle then tries to bring to light the flaws inherent in such an account, and concludes that natural processes must have a *telos* that they strive to accomplish, which empirically explains their occurring always or for the most part (198b34-199a8). Combining the image of crop growth but also the position of molars in our mouth, the passage is worth quoting at length:

... why should not nature work, not for the sake of something, nor because it is better so, but just as the sky rains, not in order to make the corn grow, but of necessity? (What is drawn up must cool, and what has been cooled must become water and descend, the result of this being that the corn grows.) Similarly if a man's crop is spoiled on the threshing floor, the rain did not fall for the sake of this—in order that the crop might be spoiled—but that result just followed. Why then should it not be the same with the parts in nature, e.g. that our teeth should come up of *necessity*—the front teeth sharp, fitted for tearing, the molars broad and useful for grinding down the food—since they did not arise for this end, but it was merely a coincident result; and so with all other parts in which we suppose that there is purpose? Wherever then all the parts came about just what they would have been if they had come to be for an end, such things survived, being organized spontaneously in a fitting way; whereas those which grew otherwise perished and continue to perish, as Empedocles says his 'man-faced oxen' did (*Phys.* II 8, 198b17-33).

Accidentalism cannot explain the 'type permanence' of organic functions; explanations which rely on chance cannot explain why "man is generated from man" (*PA* I 1,

640a25) or “a chance seed does not come from a chance body” (641b27-28). Empedocles thinks that outcomes are accidental, which is why he believes that oxen can produce offspring with human heads (*Phys.* II 8, 198b32). There is a *permanence of types*, as opposed to a random appearance and disappearance of species, such as the Empedoclean humans with ox-heads or “man-headed calves” (198b31-32, Ackrill), “ox-headed offspring of man”¹⁵ which play such a central role in Diderot’s anti-finalistic and speculatively transformist materialism. Monstrous births are a case of necessity opposing teleology: the blind necessity ingrained in the material which obstructs the proper development characteristic of natural teleology.

Since natural processes seem to originate either by coincidence or for the sake of something, and since such processes could not have originated by chance or spontaneously, then *all natural processes will originate for the sake of something*. No evolutionary type of theory would (it bears saying) fit into Aristotle’s view of nature due to this premise. A materialist theory of spontaneous formations of matter which survive due to their fitting character cannot ground the observable regularity of nature. It still leaves the observer with an unsatisfactory invocation of chance and randomness. At any moment material combinations that originated by chance are subject to suffer another change by chance. Indeed, Aristotle often asserts that Nature is not the way it is because it *became* that way; rather, it *becomes* so because it *is* so: “becoming is [...] for the sake of being”; “Coming-to-be is for the sake of being, not being for the sake of coming to be,” which Ross renders as “the process of evolution is for the sake of the thing evolved, and not this for the sake of the process,” or, in Cherniss’ formulation: “Generation is due to essence rather than essence to generation.”¹⁶

2.3.2 ‘Matter For the Sake of X’

In the previous section I discussed Aristotle’s critique of materialist emphases on chance and necessity, in favor of a notion of ‘for the sake of’, which justifies the order, regularity and persistence found in Nature (cf. *Phys.* II 8, 198b34). Moving further into biology, the dimension I emphasize now is how Aristotle can also shift his focus to the ‘microworld’ to defend his position. Against Empedocles’ vision of a chaotic cosmology of perpetually reconfigured parts, in which “heads can spring up without necks” (*GA* I 18, 722b21), Aristotle asserts that chance and accident cannot explain the presence of a properly physiological ‘for the sake of’. Not only do various ‘events’ or ‘processes’ in Nature illustrate the presence of final causality; so does the constitution of a living organism.

¹⁵Diels-Kranz B59, B61; Kirk et al. (1983), # 380, 304. For more on Aristotle and Diderot on monsters see Wolfe, ed. (2005), particularly the essay by Johannes Fritsche.

¹⁶Respectively, *GA* V 1, 778b6; *PA* I 1, 640a18 and Ross (1949), 125; Cherniss (1964), 258.

An organism is comprised of three levels of organization (or composition) for Aristotle: elements, tissue and organs.¹⁷ *Elements* (in fact the elements of matter: earth, air, fire and water) are matter for the uniform parts; *Tissue* is the uniform parts (= homogeneous, homoeomerous: 'made up of like parts', comprised of identical constituents), such as flesh, blood and bones: these are matter *for the organs*; *Organs* are the non-uniform parts (= heterogeneous, non-homoeomerous: 'made up of unlike parts', i.e., the constituents are not identical); these are organs such as the hand or the face. Somewhat counter-intuitively, at first sight, they are the matter *of the animal itself*. Now, the mere admixture of elements cannot produce complexity, but only further admixture. If a man is destroyed into bones and muscle and flesh, he is not composed of them in the sense that they are parts of his *οὐσία*; rather, they are "parts as matter," parts of the composite but not of the *logos* (*Met. Z* 10, 1035a18-22). Furth suggests a similar thought-experiment, doubtless inspired by this passage but more grisly, which brings out its main points more clearly:

A horse is obviously more than a mixture, and not homogeneous at all: it has a *structure* without which the same elements in the same proportions certainly do not add up to a horse. This is easily seen by the simple if distressing expedient of putting the horse through a large grinder, and carefully preserving all the material coming out the other side—whereby are obtained exactly the four elements composing the original horse ..., but no one will mistake that quantity of matter for a horse. For the *structure* has been destroyed (Furth 1987, 45).

Or, in Gill's more gentle example: "Eggs, flour, water, butter, and sugar must be mixed and baked, and only then is there something that is cake" (Gill 1989, 151). A certain quantity of a kind of matter *in an X* is different from that same quantity *in another X*. "Blood will not be blood, nor flesh flesh, in any and every state" (*GA* I 18, 722b34). The material structure of a part *per se* matters less than 'where' it is: a hand separated from the body is no longer a hand. A hand can only be understood as a hand inasmuch as it belongs to an ensouled body, i.e., matter animated by a form. Thus the material part, the hand, is derivative of the formal part, the soul. It is precisely this mere homonymy between a 'dead' hand and a 'live' hand which Democritus misses, in Aristotle's view (*Met. Z* 11, 1036b32). If each animal and part would be defined by shape and colour, "Democritus would be right"; but "the dead man has the same conformation of shape [as a man], but nevertheless is not a man" (*PA* I 1, 640b29, b35).¹⁸

Aristotle also asks us to imagine a doctor in an Empedoclean-Democritean world (a world made up only of homogeneous matter): s/he would only know about bile and phlegm, and not about the 'science of medicine' as a formal discourse; the materialist doctor, so to speak, would not have "knowledge of health" (*Phys.* II 2, 194a22). The materialist doctor would only be able to endlessly describe and

¹⁷ *PA* II 1, 646a12-b10 (building on I 1, 640b20); *GA* I 1, 715a9-11; *GC* I 5, 321b16-22.

¹⁸ A further, comparative issue would be: when early modern natural philosophers oppose vitality to dead matter, are they extending this 'compositional' point? Except perhaps for Leibniz's reflections on machines of nature, it seems not. In addition, the passion in the eighteenth century for the image of the bee-swarm as a model for organism, *including in materialist authors such as Diderot* (see Wolfe 2014b), rather disturbs the purity of this opposition!

prescribe elements and their mixtures. S/he would not be able to say what an organ is *for*. In terms of levels of organization, Aristotle might say that the doctor does not need to have 'molecular' knowledge of what muscles are made of, but only knowledge of the end which they are for.

Aristotle's perspective here seems closer to an 'enriched materialism', that is, a materialism which integrates a theory of levels of organization. Unlike many anti-materialists of the early modern era (and later!), Aristotle does not naïvely oppose a world of dead matter (or 'mechanistic' matter) to a world of life and meaning (see Chaps. 4 and 5 below for some instances). Up to a point, faithful to his 'triangulation' of pure idealists such as Plato and pure *phusiologoi* such as Empedocles or Democritus, Aristotle in fact *integrates* the materialistic level rather than denying it. Instead of asserting a 'for sake of' over and against the materialist theories of chance and necessity, here he asserts the 'for the sake of' as being the *internal structure of matter itself*.¹⁹

Some commentators feel that what I called Aristotle's 'enriched' materialism cannot be a materialism at all, that is, he cannot be said to accept or integrate an Empedoclean level into his hierarchical conception of the levels of organization. Preus, for instance, declares that "Aristotle's matter is not the atoms of the atomist, nor the matter of anyone who finds material reduction to be an adequate explanation of physical phenomena."²⁰ However, he provides a description of the hierarchy quite similar to Furth's: "Aristotle's matters form hierarchies; each material has more form than the material from which it is made, but has less form than whatever it can be made into, whatever it is matter *for*" (*ibid.*) It depends how much one is willing to grant to the 'basement level', as will be apparent in the Renaissance and early modernity when matter is reconfigured as possessing 'appetites', e.g. in Telesio and Bacon (Giglioni 2010).

Aristotle's emphasis on Form then appears to be less of a metaphysical *fiat*, and more of a response to a world in which there was no 'microphysics'²¹: a world in which matter was not characterized by *structure*, so that the further one would get in terms of microscopic resolution, the more *homogeneous* the matter would be, in Aristotle's terms. Hence the structure would have to be provided by the form. The burden of proof at that point is borne by the atomist, since the sorts of 'this' that we meet in everyday life are 'wholes', individuals, substantial kinds which lose their definition, their unity, if they are divided into parts (*Phys.* VI 1, 231a21f.).

As we have seen above (Sect. 2.2.3), Aristotle's guiding question is not 'why is there something rather nothing?', nor 'what is X made out of?'. Rather, he might

¹⁹Thus Aristotle differentiates between Democritus' atoms as far too abstract (and thus not explaining the world as we experience it) and Empedocles' significant improvement, defining, e.g., organic tissue as "the *logos* of the mixture" or "ratio of the combination" of these elements, an actual formula rather than a random iteration of elements (*PA* I 1, 642a15; *GC* I 1–2, 315a4–b5; Democritus and Leucippus were the first to truly inquire into the 'formulas' of living beings, a26f.; see also *GA* V 8, 789b3). The translations are respectively from Preus (1975), 29, referring to Peck, and from Barnes' edition.

²⁰Preus (1975), 95.

²¹Furth (1988), III, § 9, i.

ask: ‘why did X come to be?’ What are the sources which brought X into being, and which can also explain its passing? Alternately, what are the causes which enable us to understand X otherwise than as a merely contingent phenomenon? The answer I have focused on here would take the form ‘to understand X is to understand what X is *for*’. The *for-the-sake-of* as an explanation of natural processes and material organization is also an expression of the metaphysical notion of potentiality.

2.4 Conclusion

Aristotle’s anti-materialist arguments arise in debate with the natural philosophers who preceded him. Plato asserts the primacy of form, the *phusiologoi* assert the primacy of matter; Aristotle will ultimately opt for form *and* matter. If we wish to read Aristotle as a kind of empiricist, we can see him as observing actual natural processes, and asking “why?”, “what for?” (and then, reflecting the structure of potentiality and actuality, asserting that *any natural process X can be understood as being ‘for the sake of something’*). But of course we can also read Aristotle as a top-down teleologist. He thinks he has refuted the materialist position by giving the choice between an explanation from chance and coincidence, or an explanation in terms of ends. Since the structure of organic beings cannot be explained solely in terms of chance, it must be explained in finalistic terms. What about chance? Chance is the *real* materialist argument, it is the only genuine challenge to a fully finalistic conception of the universe, and it is very operative in authors such as Lucretius (in late antiquity) and Diderot (in the Enlightenment); its pertinence seems to drop off for a stretch of time including Darwin’s heyday, surprisingly, but beginning in the early twentieth century, thinkers such as John Dewey (see Chapter 1 in Dewey 1910) see Darwinian appeals to chance and mutation as the most powerful retort against teleology and finalism – now of the Hegelian sort.

Aristotle thus recognizes that he has to reinforce the ‘for the sake of’ over and against chance. The materialist cannot, on the Aristotelian view, either give a satisfactory account or a justification of the teleological (or ‘functional’ in naturalized parlance) properties of an organism. This view is also grounded in Aristotle’s understanding of the priority of essence over accident, of *vous* and nature over “chance and luck” (*Phys.* II 6, 198a5-13). In *Physics* II and the biological writings such as *GA* and *PA*, this supports the claim that all parts of an organism exist *for the sake* of that organism and its flourishing. When Aristotle considers biological entities, what he is looking at—or looking *for*—is *form and function*, and not the ‘brick-and-mortar’ vision of a strictly quantitative approach, which is precisely the ‘elementalism’ he criticizes in the *phusiologoi*, the materialists.

Might Aristotle believe that teleological explanations are only *methodologically* superior to material explanations? That is, could it be the case that given a complex phenomenon such as embryo development, in Aristotle’s terms the growth from a seed into a man, we need concepts of end or completion to explain it, rather than believing that such concepts reflect reality itself? The answer should be clear if we

recall the appeal to the Prime Mover: on the contrary, living beings are *goals in reality*. “Their existence ... is what controls and directs those aspects of the processes of generation that need to be explained by reference to them, and that, indeed, is why they need to be so explained.”²² So, for example, Aristotle states in the *Physics* that “clearly the final cause is within the things that come about and exist by nature ... If the art of ship-building were present in the timber, it would be acting like nature”; so nature is a cause in the sense of being “for the sake of something” (II 8, 199a8-b26), or, as Ackrill puts it, the ‘for-the-sake-of-something’ is “present in nature.” If matter is perishable and the world is eternal, formal natures have to be able to reproduce themselves in a way which Democritean accidentalism cannot account for: the ‘reproductive’ character of nature is for the sake of its eternity. The ‘for the sake of’ enables all species to interact successfully, and reproduce themselves in a fixed fashion (directly opposed to Empedocles’ ‘evolutionism’²³). Ultimately, if an organ performs a function, it is for the sake of the good, since nature does nothing in vain,²⁴ and never fails in what is necessary.²⁵

Aristotle’s *Auseinandersetzung* with materialism must be seen in the context of his desire to provide a satisfactory account of change which will not dissolve the permanence of substances into a world of chance or necessity. At the intersection of biology and metaphysics, the concept which does the most ‘work’ for him in this regard is that of ‘for the sake of’. As an explanation of natural processes it justifies (for him) the permanence of types, in reproduction and in morphogenesis, better than the ‘random’ explanations of the materialists. As an explanation of the organism itself, it is less of an assertion of final causality over and against the material explanations, and more of an explanation of organic functioning *in terms of* the ‘for the sake of’. It is indeed a ‘third way’, but it is certainly not a ‘naïve’ beginning from the biological world without metaphysical baggage: there is a strongly metaphysically grounded concept of ‘for the sake of’ as the “better” which orients both the anti-materialism in particular and the biology in general. “The end should not be just any last thing, but the best” (*Phys.* II 2, 194a31).

²² Cooper (1987), 273.

²³ One might at first want to say ‘proto-evolutionism’; but if one recalls that Darwin’s theory is a theory of *natural selection*, it seems fair to allow other theories such as Empedocles’ and Lucretius’ to be called “evolutionistic,” since they describe the change of species over time. Then the question becomes: is this evolution at all ‘teleological’, that is, does it include an element of perfectibility? At a more precise level, though, one should take note of David Depew’s remark: “Darwin’s explanation of adaptedness does not rely on ... chance and coincidence in the same way Empedocles and Democritus do ... On the contrary, natural selection, by systematically amplifying initially happen-stance variations through populations across many generations in strict accord with environmental utility, excludes the coincidental from playing the role in the coming to be of organic traits assigned to it by Democritus and Empedocles” (Depew 1997, 226).

²⁴ *PA* II, 658a9; *GA* II 6; *DA* III 12, 434a31.

²⁵ *DA* III 9, 432b21.

Title abbreviations used: *DA*: *De Anima*; *GA*: *Generation of Animals*; *GC*: *On Generation and Corruption*; *MA*: *Movement of Animals*; *Met.*: *Metaphysics*; *PA*: *Parts of Animals*; *Phys.*: *Physics*; *PoA*: *Posterior Analytics*. Translations used include those of Barnes (Aristotle 1984), Ackrill (Aristotle 1987) and Apostle (Aristotle 1979), with modifications.

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Chapter 3

Chance, Necessity and Transformism: Brief Considerations

Abstract If Aristotle's system combines metaphysics and biology in a two-pronged assault on the 'reign of chance' characteristic of ancient atomism, the Renaissance and early modernity witness the emergence of two curious intellectual formations: on the one hand, a kind of naturalized Aristotelianism, with figures like Pomponazzi, influencing important works of the anonymous, clandestine tradition like the *Theophrastus redivivus* and its critique of 'the gods'; on the other hand, a renewed interest in both the metaphysics of a chaotic universe (along with its possible ethics), and, in response to cases such as fossil evidence, what I'll call the metaphysics of transformism. Transformism comes hand in hand, in the authors we examine, with a unique form of 'embodied' determinism, inspired by Lucretius and very distinct from the predictability-oriented forms of determinism we are familiar with post-Laplace.

3.1 'Un coup de dés jamais n'abolira le hasard': Materialism, Transformism and Chance

Considéré relativement à ses parties & à leur ordre réciproque, le monde est un ; il n'a point d'ame: ce n'est donc point un dieu ; sa formation n'exige aucune cause intelligente & suprême. Pourquoi recourir à de pareilles causes dans la Philosophie, lorsque tout a pu s'engendrer & peut s'expliquer par le mouvement, la matiere, & le vuide ? Le monde est l'effet du hasard, & non l'exécution d'un dessein. Les atomes se sont mûs de toute éternité. Considérés dans l'agitation générale d'où les êtres devoient éclore dans le tems, c'est ce que nous avons nommé *le chaos* ; considérés après que les natures furent écloses, & l'ordre introduit dans cette portion de l'espace, tel que nous l'y voyons, c'est ce que nous avons appelé *le monde* (« Epicurisme », *Encyclopédie* V, 779–785).

If Aristotle's system combined metaphysics and biology in a two-pronged assault on the 'reign of chance' characteristic of ancient atomism, the Renaissance and early modernity witness the emergence of two curious intellectual formations: on the one hand, a kind of naturalized Aristotelianism, with figures like Pomponazzi, influencing important works of the anonymous, clandestine tradition like the 1659 *Theophrastus redivivus* (Paganini 1985) and its critique of 'the gods'; on the other hand, a renewed interest in both the metaphysics of a chaotic universe (along with its possible ethics), and, in response to cases such as fossil evidence, what I'll call

the metaphysics of transformism (understanding by transformism, the idea of a modification of species over the course of generations, and the common descent of all species). Transformism comes hand in hand, in the authors we examine, with a unique form of ‘embodied’ determinism, inspired by Lucretius and very distinct from the predictability-oriented forms of determinism we are familiar with post-Laplace.

While it may well be “useless to begin [the account of evolutionary theories] before Darwin,” given that, even if “one can undoubtedly locate all sorts of pre-Darwinian evolutionary concepts, retrospectively. ... nevertheless Darwin introduced such a [high degree of] systematicity in the representation of life that it is only with him that a genuine field of controversy on transformist theory emerges,”¹ I wish to point to a different issue, concerning the relation between transformism and materialism. While traditional anti-precursor histories will lump together figures such as Diderot, de Maillet and Goethe as thinkers who believed in the variability of species, but were just speculators, like the ancient Greeks,² a closer consideration shows that a world separates a Diderot from a Goethe, or even from a Voltaire, who rejected the claim made in his day by Benoit de Maillet (the consul in Cairo and author of the ‘proto-evolutionary’ text *Telliamed*, written 1692–1708) that the fossils of fish were remains of earlier species – Maillet had presented a phantasmagoric vision of fish being accidentally stranded on the earth, and learning how to fly over a series of random attempts lasting one million years.³ For Voltaire, these petrified fish were merely rare specimens tossed away by the ancient Romans because they were not fresh; and most generally, “men were not fish, contrary to what Maillet says.”⁴

Something very different is going on in Boulainvilliers, Fréret, La Mettrie, Buffon, Diderot, and anonymous texts like the *Tintinnabulum* (see Anon 2002). They are reductionists who believe that Nature and its chance occurrences exhaustively explain the nature of reality, something that was frequently denounced. For Diderot, in his celebrated *Letter on the Blind* of 1749, “If we went back to the birth of things ... we would encounter a multitude of shapeless beings, and just a few well organized beings. ... I assure you that the former had no viscerae, and the latter no stomach ... ”⁵ He describes this “extravagant supposition” as “almost the real history of all animal species, surviving and to come”; “we cannot predict all their

¹ Gayon (1999), 392.

² King-Hele (1963), 66.

³ In *Telliamed* (de Maillet 1755/1984), De Maillet argued that the Earth is several billion years old, on the basis of sedimentation in the Nile valley. An ocean once covered the entire Earth and had been in gradual retreat for an incredibly long time. *Telliamed* is often understood to be an ‘anticipation’ of evolutionary thought; however, Maillet does not formulate any idea of species-transformation, because he holds that all species already existed in the sea, and simply generated analogs on earth.

⁴ Voltaire, art. “Coquilles,” in Voltaire (1764/1967).

⁵ Diderot, *Lettre sur les aveugles*, in Diderot (1975-), IV, 50; reproducing some of Lucretius, *De rerum natura*, V, 828–831, 837–854.

metamorphoses.”⁶ All of this is very reminiscent of Empedocles, including in the (critical) portrayal of his views given by Aristotle. Recall that Empedocles was the ‘proto-evolutionist’ who speaks of “man-faced oxen,” in a chaotic cosmology of perpetually reconfigured parts, in which “heads can spring up without necks”; it is, of course, a universe of chance and ceaseless combination of organic parts, sometimes resulting in the individuals and species we know, sometimes not. In Aristotle’s view, as discussed in the previous chapter, this can never explain the regularity of Nature – what we would call ‘design’.⁷ For Diderot, “to be born, to live, to die is merely to change forms.”⁸ He also explicitly uses the Lucretian phrase *Rerum novus nascitur ordo*. Should these be understood as anticipations of evolutionary science?

In fact, what one should *not* say about the above kinds of statements is that “Diderot reaches a concept of evolutionism which is the most complete and brilliant speculative exposition of that doctrine in his time.”⁹ Or, in even more absolutist terms: “the most significant basis for the historian’s admiration of Diderot is that he ... was the first transformist.”¹⁰ In fact, the problems with these kinds of interpretations are much the same as with the ‘negative’ judgment that Diderot and Goethe were speculators like the ancient Greeks.

Instead, materialism is intimately bound up with a metaphysics of transformism. It often has an ‘evolutionary’ concept of matter, from Lucretius to Diderot and onwards (despite Whitehead’s surprisingly naïve assertion that “Evolution, on the materialistic theory, is reduced to the role of being another word for the description of the changes of the external relations between portions of matter. There is nothing to evolve”¹¹), but the converse is not true: the theory of evolution requires no metaphysics of matter. For instance, in his *Système d’Épicure*, La Mettrie seems to equate being ‘pro-Epicurean’ with specifically biological themes such as the appearance and disappearance of animal species (§ 10), and he recounts the first stages of the Earth as a fertile, nutritive ground which produces living beings, reminiscent of Lucretius’ “Alma Venus” (§ 11). La Mettrie’s Epicureanism has a vital flavour to it; it is bound up with a metaphysics of animate matter. Perhaps a more pure statement of the metaphysics of transformism is that of Dom Deschamps, who criticizes our cognitive tendency to “search for a beginning of each species”; we can easily imagine, he argues “that a species comes to an end,” but we can’t imagine it beginning. “Why is this? It’s because indeed, it didn’t begin, in the way we would like to imagine, but rather, it sprang from other species over the course of centuries, when many

⁶ Diderot, *Rêve de D’Alembert*, in Diderot (1975-), XVII, 126.

⁷ Aristotle, *Physics* II 8, 198b17–33; *Gen. Anim.* I 18, 722b21. See above Chap. 2 and for an interesting commentary on Aristotle on Empedocles, see Fritsche (2005).

⁸ Diderot, *Rêve de D’Alembert*, in Diderot (1975-), XVII, 139.

⁹ Crocker (1968), 129.

¹⁰ Paitre (1904/1971), 89.

¹¹ Whitehead (1925), 151, 109.

things occurred that we do not even suspect.”¹² D’Holbach clearly granted that he did not know the origin of our species:

From whence comes man? From which initial origin? Was the first man the effect of a random encounter of atoms? ... I know not. I would have no better an answer to the question, from whence came the first stones, the first trees, the first lions, the first elephants, the first ants, the first acorns? (D’Holbach 1772, I, § 42).

But is this evolution? One thing it is, is a kind of *monism*, from Diderot to Erasmus Darwin, to Lamarck and Haeckel (and Samuel Butler, e.g. in *Life and Habit*). Butler promotes past figures a lot (including Erasmus Darwin who has a Lucretian metaphysics of living matter much like Diderot’s and a vision of transmission much like Lamarck’s: Darwin 1794) in order to weaken Charles Darwin’s claims to originality. He argues for the existence of two kinds of evolution, a more materialist kind and a more mental or spiritual kind, and wants to defend the latter, in contrast to Erasmus Darwin, who is associated with the former. For E. Darwin, in contrast, there is no claim about a fundamental coherence of life throughout the natural world, from atoms to the ‘living macrocosm’ of the universe. Further, as has been discussed a good deal in recent years, natural selection is *not* a theory of biological organization (the latter tends to be affiliated with a theory of living matter; someone like Haeckel tries to blur this distinction or bridge this gap).

Even if it is true that natural chance plays a role in both, say, Empedocles and Darwin’s theories, as David Depew nicely notes, “Darwin’s explanation of adaptedness does not rely on ... chance and coincidence in the same way Empedocles and Democritus do ... On the contrary, natural selection, by systematically amplifying initially happen-stance variations through populations across many generations in strict accord with environmental utility, excludes the coincidental from playing the role in the coming to be of organic traits assigned to it by Democritus and Empedocles.”¹³ Ultimately, as J. Roger put it so well, “to be a precursor of Darwin it is not enough to be a disciple of Lucretius.”¹⁴

There is a vision of chance as productive of forms in these materialist philosophies of nature. They are not calling for a distinct science of evolution but rather exploring implications of monism. Their vision of a chaotic nature, producing more or less stable, viable forms and then ‘exterminating’ them, does not seem very nomological or indeed very inclined to formalization or prediction. As such, it makes for a very distinctive kind of determinism, in addition.

¹²Deschamps, *Observations métaphysiques* (1761), § VII in Deschamps (1993), I, 374.

¹³Depew (1997), 226.

¹⁴Roger (1993), 471, n. 66.

3.2 Determinism Without Laws of Nature?

Early modern determinism was not necessarily of the sort that would become, by the late eighteenth century, ‘Laplacean’ determinism. It was what I have called elsewhere an *embodied* determinism (Wolfe 2007), that is, not a Laplacean vision in which the universe is composed of basic particles which could then be mapped out exhaustively in a mathematical form, but instead, a biologically and psychologically complex account of what it is to be an embodied agent, acting in the midst of a variety of causal chains, some fully internal, some external – like Hobbes’ “endeavours” or La Mettrie’s vision of our state of desire as uneasiness as like “a bird on the branch, always ready to take flight” (*Discours sur le Bonheur*, in La Mettrie 1987, II, 262).¹⁵

The biological make-up of an individual is an irreducible feature of that individual. As such, it can serve as a set of identifying features which pick out what is unique about her, but it is also a *limit* to her corrigibility. Helvétius had described to Diderot how severely he was punished for his earlier work *De l’Esprit*, with the consequence that he would “rather die than write another line again.” Diderot responds in his ‘Refutation of Helvétius’ with a long tale about two cats he saw from his window, who fell from a roof: one died from the fall, the other got up, bruised and bloodied, and said to himself, “I would rather die than ever climb on the roof again. What am I looking for there? A mouse that is not worth the tasty morsel I could get from my mistress, or steal from the cook ...” However, as soon as the cat feels better, he climbs back up on the roof again. Just as Leibniz is portrayed as a “thinking machine” who cannot help what he does, and the cat is determined by his own constitution and drives, similarly, Helvétius has no choice but to go on writing (in Diderot 1994, 807).

Diderot is a determinist, albeit of an idiosyncratic, ‘expanded’ variety, about most questions, but he is also in a very fundamental way a Lucretian, believing that the universe is composed of atoms in perpetual transformation. (The first version of *D’Alembert’s Dream* was entitled *Democritus’ Dream*.) He did not see a contradiction in between being a determinist (if, admittedly, of an ‘expanded’ sort) and denying that the world reduces to predictable, mechanical laws, because of his vision of living matter in perpetual transformation. We might find it inconsistent to be a determinist most of the time and then also be an indeterminist about the cosmos; however, one must notice that this ‘indeterminism’ in no way supports the existence of free will or uncaused action, in Diderot’s eyes. If the world is “a giant gambling-den

¹⁵For more on this kind of determinism see Wolfe (2007) and (2010). That this was an *embodied* determinism is also evidenced more amusingly by juxtapositions such as those found in the libertine, clandestine work *Thérèse philosophe* (approx. 1748), in which philosophical arguments for ‘Spinozistic’ determinism are presented within an erotic narrative inspired by a contemporary scandal involving a priest and a gullible young woman (Thomson 2008, 171); for more discussion of the textual and ideological bricolages at work in these clandestine bestsellers, see Darnton (1995).

in which I've spent my sixty-odd years with the dice-cup in hand, *tesseras agitans*,"¹⁶ this does not render my actions any more free or uncaused; simply, it means I do not know the fundamental laws of nature which explain them, either. Similarly, La Mettrie had stated that we are determined by our bodily states such as "the blood flowing through our veins" or "the whirlwind of animal spirits in us," but immediately adds (in good Epicurean fashion) that this makes our actions quite unpredictable! Diderot's emphasis on randomness in Nature, as evidenced notably in the frequent productions of monsters, reflects the rather Humean sentiment that "anything can fail to cause anything," or, in the language of the period, that "all particular beings, as they are ceaselessly acting and reacting on one another, simultaneously produce and undergo changes," thus "the same being which is a cause at present was an effect in the previous instant" (this is Nicolas Fréret, predating both Hume and Diderot).¹⁷

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, are deterministic *just like* a simple machine. 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 to hold, like Helvétius, d'Holbach or Hobbes before them, that there is a fixed, stable and predictable relation between our sensory input, our mental life and consequently our 'temper' and our actions: "As a being that is organized so as to think and to feel, you must feel pleasure or pain; you must love or hate in accordance with the way your organs are affected by the causes surrounding you or within you."¹⁸

3.3 Conclusion

The primacy of chaos accompanies the particularly biologicistic flavor of much of early modern materialism, with its revival of Lucretian and/or Empedoclean motifs. Exactly that which Aristotle sought to refute, returned with a vengeance, stimulated at times by actual 'discoveries', in a manner which can lead us at times to see this form of materialism as somehow close to evolutionary thought. The harsh critiques of the concept of 'precursor' in the 1960s caused this particular form of interest to recede, but it remains the case that a good deal of the metaphysics of nature found in materialist territory in this period flirts with themes of the radical mutability of species and the transformation of the Earth over time. This comes hand in hand with

¹⁶ *Eléments de physiologie*, in Diderot (1975-), XVII, 516.

¹⁷ Fréret (1986), 343.

¹⁸ D'Holbach (1770/1781) in d'Holbach (1990), I, I, 18; cf. Donald Davidson's remark: "Hobbes, Locke, Hume, Moore, Schlick, Ayer... have done what can be done... to remove the confusions that can make determinism seem to oppose freedom" (Davidson 1973, 137), in the sense that our actions are determined by causal chains other than strictly physicalistic ones.

a uniquely Lucretian-flavoured form of determinism. In the next two chapters, I explore some further extensions of these Epicuro-Lucretian tendencies, in materialist approaches to the body and to ethics.

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Chapter 4

Early Modern Materialism and the Flesh or, Forms of Materialist Embodiment

Abstract Materialism, and its approach to the body, are often presented as “mechanistic”: as signifying that the properties unique to organic, living embodied agents are reduced to or specified as mechanistically specifiable properties that characterize matter as a whole. Indeed, from Hobbes and Descartes in the seventeenth century to popular automata such as Vaucanson’s in the eighteenth century, this vision of things would seem to be correct. I aim here to correct this inaccurate vision of materialism. On the contrary, the materialist project on closer consideration reveals itself to be significantly focused on “Life” and embodiment, much more intimately connected to what we now call “vitalism” (a case in point being the eighteenth-century Montpellier vitalists), and ultimately an anti-mechanistic doctrine focusing on the uniqueness of organisms—whether we construe this focus in ontological or explanatory terms. To establish this revised vision of materialism I examine texts such as La Mettrie’s *Man a Machine* (1748) and Diderot’s *D’Alembert’s Dream* (1769) along with medical entries in the *Encyclopédie* by physicians such as Ménuret and Fouquet. I argue that there is a specifically materialist approach to the body in early modernity; that it is not strictly mechanistic (or is an outgrowth of a very pluralistic, loosely defined brand of mechanism), but that it retains a claim to be understood as materialist precisely because it is a reductionist, deflationary account of what it is to be in a body. This reconstruction also has implications for current discussions of embodiment: the materialist conceptualization of embodiment does not postulate an organizing center, a Subject which gives the kind of quasi-transcendental status to the flesh we often see, e.g., in phenomenological and post-phenomenological discourses.

4.1 What Is Materialist Embodiment?

In what follows I inquire into the specifically materialist understanding of embodiment in early modernity. I aim both to correct some misconceptions about the poverty of the materialist outlook on embodied, affective, fleshly, sensing agents and, *mutatis mutandis*, to challenge some comfortable presuppositions about the uniqueness or transcendence of embodiment faced with the physical world as a whole. By doing so, I seek to articulate a concept of “materialist embodiment” which is not the

mere affirmation, “That which is not body is no part of the universe” (Hobbes) or “In nature nothing exists besides individual bodies, performing pure individual acts according to a law” (Bacon).¹ Clearly, there is no sense here of what it feels like to be gendered, athletic, disabled, feverish, chocoholic or to have spent a night in a cheap train couchette. So what might materialist embodiment be?

The emergence of modern materialism is often presented as a fiery, ideological outgrowth of the forms of mechanism that emerged in the Scientific Revolution. Now, mechanism itself comes in a variety of forms: for Robert Boyle, the basic properties or “qualities” of things can be exhaustively explained in terms *of*, if not reduced *to* “the motion, size, figure and contrivance of their own parts,” with new qualities being produced by “changing the texture or motion” of these basic parts.² As regards the body, and thus more macroscopically, Descartes says he’ll assume the body is nothing other than “a statue or machine made of earth,” to which he adds celebrated analogies with the machinery of fountains and other sorts of clockwork.³ Some mechanists such as Herman Boerhaave, the great Leiden professor of medicine, go as far as claiming that “the nature of the human body is the same as that of the whole of the Universe,”⁴ which is an ontologized restatement of the essential claims of mechanism: it is not just that matter itself can exhaustively be defined in terms of shape, size and motion, or that the body should be studied as if it were a mechanistic arrangement of matter—but that the body is itself the same *in essence* as the rest of the universe: mechanical. Hobbes famously applied to this to the mind as well: in the early modern context, he was the first to present the mind as fully belonging to the causal realm – indeed, to the world of *motion*, in his terms – and thus explicable by necessary laws:

I thought continually about the nature of things, whether I was traveling by boat or by coach, or on horseback. And it seemed to me that there was only one true thing in the whole world, though falsified in many ways: one true thing, which is the basis of all those phenomena which we wrongly say are something (such as we fleetingly get in sleep, or with the aid of lenses can multiply as we choose) – the phenomena of sense-impressions, which are offsprings of our skull, with nothing external. And in those internal regions, there could be nothing but *motion*.⁵

¹Hobbes (1651), IV, § xlvi, in Hobbes (1994), 459; Bacon, *Novum Organum* II, ii in Bacon (1857–1874), VIII, 168.

²Boyle, *The Origin of Forms and Qualities* (1666) in Boyle (1772/1965), III, 13; *Some Considerations Touching the Usefulness of Experimental Natural Philosophy*, II (1671), in Boyle (1772/1965), III, 427.

³Descartes, *Treatise on Man*, AT XI, 120, 130–131, 202.

⁴In a 1703 lecture revealingly entitled “On the Usefulness of Mechanical Methods in Medicine” (Boerhaave 1703/1907, 146; Boerhaave 1983, 96).

⁵From Hobbes’s verse autobiography, written when he was eighty-four, translated in Tuck (1988), 248). For the original English translation, see Hobbes (1994), here, lvi–lvii. In his much earlier unpublished critique of Thomas White’s 1642 *De Mundo*, Hobbes also stated that “Fancies, or images in the mind, are really nothing but the motion excited in the brain by objects; therefore the cause of that motion must be a motion in the parts of the object, because motion, by its nature, can be created only from motion” (chap. 7, § 1, in Hobbes 1976, 79).

If materialism really was an outgrowth of mechanism, a typical example would be La Mettrie's *homme-machine* (he was after all referred to as "Herrn Maschine" in Berlin in his day), which is often described, presumably by authors unfamiliar with his writings or blinded by the prevalence of older interpretive schemas, as simply the Cartesian *bête-machine* extended to humans.⁶ This is most often a narrative of progression or decline (depending on whether one is a positivistically inclined historian of the behavioral sciences intent on tracing a line from Descartes to cybernetics via La Mettrie⁷ or a moralistically inclined philosopher intent on showing how the triumph of mechanism and/or materialism spelled the death of 'meaning and value'⁸). But my point here is that if we consider these narratives from the standpoint of *embodiment*—of our existence as embodied beings—it would appear that we have ended up with an atomistic, reductive, depersonalized way of relating to our bodies, to the fact of our embodiment. This is often decried by theorists who think something was lost at a certain historico-destinal moment of "dehumanization" or alienation.⁹

Whether we like it or not, or whether it matches our "phenomenology," in the sense of our experience of what it is to be in a body—the pain, the enjoyment, the ineffable subjectivity and so on (and thereby also a hidden essentialism of the flesh or 'biochauvinism')—we have ended up, in this tale of the Fall, with what Ian Hacking recently called "Cartesian bodies": no longer machines governed by immaterial souls, but nevertheless fully mechanical assemblages of replaceable parts, whether prostheses or artificially grown biological parts.¹⁰ Of course, there have been other responses to the growing complexity of mechanism and its materialistic outgrowths besides desperate appeals to the respect of the sovereignty of the flesh: some thinkers have celebrated the potential for hybridization between body and machine,¹¹ which goes well with a historical emphasis on the *heuristic* role of automata such as Vaucanson's duck¹² or other "living machines."¹³

But I would like to suggest a different response to this narrative: that there was a *specifically materialist sense of embodiment*. In other words, materialism was not merely an obsessive reiteration or heightened performance of the "mechanistic" vision of the body, whatever that might be: reducing it to isolated parts or defining it in accordance with general mechanical laws, but in any case factoring out the rich, fluid, *personal* sense of what it is to be in a body. This is not just because material-

⁶For correction, see Thomson (1988) and Wolfe (1999).

⁷Dupuy (2000).

⁸Husserl (1910–1981); Ruyer (1933); Jonas (1966).

⁹Merchant (1980); Kass (1995).

¹⁰Hacking (2006). That Hacking may be out of date with respect to our scholarly understanding of Descartes, as I discuss below, doesn't affect the prevalence of our concept of the "Cartesian body" (a.k.a. Ryle's "ghost in the shell"), which is all that matters here.

¹¹Haraway (1991), Hayles (1993) and (2002). I have tried to address some of these 'new materialist' developments in relation to earlier, 'vital' forms of materialism in Wolfe (2015).

¹²See Riskin (2003); Wolfe (2012).

¹³Keller (2010).

ists frequently repeated like a mantra that everything that is real is (a) body (as in Hobbes and Bacon above). Diderot gives the “all is body” claim a more reductionist tonality, when, in the *Elements of Physiology*, an unpublished work which occupied him during the last two decades of his life, he explains that “the action of the soul on the body is the action of one part of the body on another, and the action of the body on the soul is again that of one part of the body on another” and elsewhere, “wherever I read *soul* I replace it with *man* or *animal*.”¹⁴ Similarly, La Mettrie in his first philosophical work, the *Natural History of the Soul* (1745), declares that “he who wishes to know the properties of the soul must first search for those which manifest themselves clearly in the body.”¹⁵ Unsurprisingly, a word that was used as a synonym for “materialism” in the late seventeenth century, if not a very common one, was “corporealism.”

Trumpeting that “all is body” or that “wherever I read ‘soul’ I replace it with ‘body’” is not, as I indicated above, tantamount to a discourse of embodiment. But what is embodiment? I will suggest a definition, borrowing hints from two distinct, and influential intellectual traditions of recent decades. Briefly, in the study of cognition, “embodied mind” perspectives reject traditional computational approaches and present our cerebral life as necessarily occurring within a body, understood both as a dynamic system and as something fundamentally *my own* in the sense of Merleau-Ponty’s *corps propre*.¹⁶ The emphasis here is usually on how an embodied agent inhabits the world, not as one body amongst others (atoms and asteroids and Fanta cans) but as a *subject* in her own environment. In cultural studies, embodiment connotes a complex, twofold relation between historicity and gender, in which “subjectivity [is] profoundly experienced as interrelated with the physical, and societal changes or structures influenced the ways in which the body was perceived,”¹⁷ through scientific discourses but also in many other ways.¹⁸ Both of these perspectives share a sense (an intuition?) that the body exists outside of the fully spatialized, quantified pronouncements of modern science; the extent to which this is a subtle or even satisfactory portrayal of modern science is open to question.¹⁹

Regardless, the “lived body” we encounter in contemporary embodiment discourse is the body in pain, or in a state of enjoyment; in a reflexive, indeed intimate relation to itself—quite different, according to embodiment theorists, from the more generic body in space. They maintain that the lived body (which really is *the* body

¹⁴Diderot (1975-), XVII, 334–335; Hemsterhuis (1964), 277.

¹⁵*Traité de l’âme*, I, in La Mettrie (1987), I, 125.

¹⁶Merleau-Ponty (1962), 104.

¹⁷Rublack (2002).

¹⁸Aside from the variety of works in “history of the body” that appeared at a bewildering rate during the 1980s and 1990s, in early modern studies see Bynum (1995), Reiss (1996) and Paster (1997); in embodied cognitive science, Young (2005). An interesting and original way of extending and modifying their programs, combining “humoral materialism” with “historical cognitive science” is presented in Sutton (2007), ((2010).

¹⁹For a recent attempt to compensate for the total absence of “embodiment” discourse in the history of science (here, early modern life science), see the essays collected in Wolfe & Gal, eds. (2010).

for embodiment discourse) exists at least in part “outside of physical space.”²⁰ Thus the living body—indeed, any organism—“is an individual in a sense which is not that of modern physics.”²¹ This is often presented in cultural studies as an insight countering “Cartesianism.” Many studies concerning the body, or anatomy, or early modern culture tell us that the rise of the Cartesian mechanistic world-picture is equivalent to an objectification of the body, which divorces it “from the world of the speaking and thinking subject.”²² Thus embodied mind theorists today assert quite bluntly that “Life is not physical in the standard materialist sense of purely external structure and function. Life realizes a kind of interiority, the interiority of selfhood and sense-making.”²³ In contrast, I think it is the picture of “standard materialism” that needs to be revised.

4.2 Is Mechanism the Problem?

At first sight, a deeply subjective body, or at least one in which subjectivity is somehow “irreducible,” does seem a far cry from iatromechanical and materialistic approaches to the body. Iatromechanism was an influential, perhaps dominant school of medical thought in the late seventeenth and early eighteenth centuries, under the twin influences of Descartes’ *Traité de l’homme* (1648) and Borelli’s *De motu animalium* (1680). It makes much use of celebrated descriptions of the body as a set of small interlocking machines: funnels, pulleys, windmills, and the like. For Boerhaave, amongst the “solid parts of the human body,” “some resemble Pillars, Props, ... some Axes, Wedges, Leavers and Pullies, others Cords, Presses or Bellows; and others again Sieves, Straines, Pipes.”²⁴ Baglivi, a celebrated Roman anatomist and surgeon, claims that if the body is studied in the right way, the observer

will really meet with Shears in the Jaw-bones and Teeth, ... Hydraulick Tubes in the Veins and Arteries, a Piston in the Heart, a Sieve or Straining-Holes in the Viscera, a Pair of Bellows in the Lungs ... ; the natural Effects of an animated Body can’t be accounted for with greater Facility and Clearness any other way, than by those Mathematico-Experimental Principles, by which Nature speaks her own Mind.²⁵

Or, as the London anatomist William Croone says more succinctly: “We shall consider the living body to be nothing else but a kind of machine or automaton.”²⁶

²⁰Merleau-Ponty (1963), 209.

²¹Ibid., 154.

²²Sawday (1995), 29. Recent Descartes scholarship has rejected this reading, emphasizing instead an “embodied Descartes”; see for instance Sutton (2000), Brown (2006) and, differently, Des Chene (2001); Oksenberg Rorty (1992) was an earlier move in this direction.

²³Thompson (2007), 238.

²⁴Boerhaave (1752), 81.

²⁵Baglivi (1696/1704), 135–136.

²⁶Croone (1664), sect. XXVI, 15, *cit.* Wilson (1961), 161.

Faced with this, we tend to feel that we have some broad intuitive grasp on the issue: a machine is a system of inanimate parts, presumably without a central controller, and certainly without an internal “vital principle.” Hence, when a living body—animal or human—is described as being *like a machine* (or “nothing else but a kind of machine or automaton”), we can feel fairly confident about what is happening: the various properties of organic life—the real, basic properties of what it is to be alive and in a body: self-maintenance, goal-directed behavior, and perhaps even intentionality or consciousness—are being reduced to basic mechanical properties. Notice that even these reductions are less straightforward than we might think: are living, embodied properties being defined as *the properties of machines* as understood at a given time and place, like Descartes’ fountains, or as the basic *properties of nature understood mechanically*? It is after all different to say that the heart is *like* a pump, the lungs *like* a pair of bellows, and to state (like Boerhaave) that “the nature of the human body is the same as that of the whole of the Universe.” We need further reflection on the different relations between mechanistic *ontology* (really, ontologies) and mechanistic *analogies* – including their relation to ‘the flesh’.

Instead of examining the diversity of mechanistic and reductionist explanations, however, I suggest a different point: that our intuition, our confidence in opposing “machines” to “bodies” is misplaced in an important way. After all, “machine” was often used to simply mean “body,” and mechanical models of life such as Vaucanson’s duck were attempts to understand ... life.²⁷ And conversely, when we turn to the eighteenth-century Montpellier physicians known as “vitalists”—some of whom, such as Théophile de Bordeu, were in close association with materialist philosophers such as Diderot, to the extent that Bordeu is a major character in Diderot’s experimental philosophical novel, *D’Alembert’s Dream*, unpublished during Diderot’s lifetime—we find, not invocations of a vital principle over and above the workings of the body, but the will to explain “the mechanism which subserves the functions of the animal economy,” a mechanistic level “chiefly founded on anatomical observations;”²⁸ even if La Caze some pages later adds that movement and sensation are basic, non-reducible features of the body.²⁹ Of course, the goal of explaining the workings of our organic body with appropriate concepts means focusing on the specifically *organic* structure of the body. As another Montpellier vitalist physician, Ménuret, notes in his fascinating essay “*Œconomie Animale*” in the *Encyclopédie, les Mécaniciens* “did not even pay attention to the *organic structure* of the human body, which is the source of its main properties.”³⁰

²⁷ See Vaucanson (1738/1742); Riskin (2003), and on automata in early modern Europe, Roukhomovsky, Roux et al., eds. (2012).

²⁸ La Caze (1755), 2.

²⁹ *Ibid.*, 12.

³⁰ Ménuret de Chambaud (1765), XI, 364b. For further discussion of Montpellier vitalism in relation to mechanism and materialism see Wolfe and Terada (2008).

4.3 Visceral Reductionism

The next point I wish to make about materialist embodiment—my central point—is twofold. First, unlike the approach to the body that sees it as just so many funnels, pulleys and bellows, or that seeks to establish basic mechanical laws of the body and the rest of nature, the embodied-materialist approach is “*visceral*,” figuratively and literally. It is a materialism of vital fluids, touch, affects and passions. But second, this approach, if it is to be legitimately qualified as “materialist,” necessarily has a *reductionist* component, in the sense of the ambition to explain a higher-level phenomenon X in terms of lower-level processes Y: “where I read *soul* I replace it with *man* or *animal*.” Notice, however, that if I am reducing “soul” to “animal,” my reducing theory or level of explanation is still something *alive* (with monistic implications given the blurring of the animal/human boundary, as in La Mettrie’s “The transition from animals to man is not violent”³¹). I shall describe these two contrasting dimensions—the visceral or spirited and the reductive—in more detail, before concluding with some remarks on how they hang together.

The “visceral” character of early modern materialism takes several forms. For one, it privileges medicine, natural history and the other “embodied” sciences at the expense of physics and mathematics, which are usually presented as abstractions. La Mettrie declares in *L’Homme-Machine* that “Medicine alone could [effect a] change in the mind and in people’s mores, with the Body;”³² “the Doctor is the only Philosopher who deserves the praise of his country;”³³ and it would be best “for there to be only excellent Doctors to serve as Judges, for only they could distinguish the innocent from guilty criminals.”³⁴ Not just knowledge of the body or the soul but metaphysics itself gets suffused with this medical flavor: as the vitalist Fouquet writes on “the clinic,” “not only is metaphysics not foreign to medicine, it belongs to a large extent to medicine. Medicine alone can extend and perfect metaphysics.”³⁵

In addition, the materialist understanding of body is not restrictively physicalistic or mechanistic (as in the funnels and pulleys above), because it appeals to entities such as animal spirits, and strongly emphasizes affects and passions. We often even find polemics against anatomy for its static reduction of the body to inanimate parts ... a necropolis as it were, the coldness and cruelty of the anatomist...³⁶ It is not so much the inherent mystery of individuality that is being defended here, but the sense that the dynamic, flowing character of the living body is not so easy to grasp by “anatomizing” it. Diderot has just this quarrel with more physicalistically

³¹ La Mettrie, *L’Homme-Machine*, in La Mettrie (1987), I, 78.

³² La Mettrie (1987), I, 67.

³³ *Ibid.*, 62.

³⁴ *Ibid.*, 91.

³⁵ Fouquet (1803), 16–17.

³⁶ As in Flaubert’s youthful comment: “c’est une cruauté d’anatomiste mais on a fait des progrès dans les sciences et il y a des gens qui dissèquent un cœur comme un cadavre” (“Passion et vertu,” 1837 fragment, in Flaubert 1925, 254).

inclined materialists like Helvétius (we could add Hobbes), who think that there is only one kind of causes: physical causes. Diderot is strongly concerned with the *production* of life, rather than with *basic structure*, yet he certainly did not worry about the sanctity of life; in his writings on painting he recommends painting from corpses and elsewhere he approved of the idea that prisoners condemned to death could be used for scientific experimentation.

That materialist embodiment is simultaneously vital and reductive—“*visceral*”—appears quite clearly in the case of animal spirits, which also usher in a new kind of determinism, summed up by La Mettrie and later Sade as the claim that *I am determined by the blood that flows in my veins* (even if strictly speaking animal spirits were not the same as the blood itself, but were rather carried by it). Delbène in Sade’s *Histoire de Juliette* takes the notion of an “electrification,” an “electric fire” in the body and sensualizes it, promising the lover of pleasure that “a devouring and delicious fire will slip into your nerves, it will light up this electric fluid in which the life principle lives...”³⁷ Indeed, materialism was also viewed as a philosophy of embodiment in the worst sense! In 1758 the *Nouvelles ecclésiastiques*, an important Jansenist publication, said of Helvétius’ work *De l’Esprit (On the Mind)* that it should really have been entitled “*On Diversely Organized Matter, and even better, ... On the Flesh, Particularly the Dirtiest, Most Impure Flesh.*”³⁸ This is not just a hostile projection of “dirty” hedonism onto an austere metaphysics of matter, a scientism, a theory about mind and cognition. In fact, thinkers like La Mettrie or Diderot are quite happy to opt for “base materialism.”

La Mettrie wrote several works either on Epicurean ethics broadly conceived or more specifically on pleasure,³⁹ and as discussed above, even his concept of the “man-machine” is very much more of a “desiring machine” than just a set of cogs, funnels and pulleys. Desire can be expressed quite strongly in these texts: “if you are not content to excel in the art of pleasure, and crime and debauchery aren’t strong enough for you, then filth and infamy remain yours for the glorious taking: wallow in it, as pigs do, and you will be happy like a pig.”⁴⁰ What La Mettrie leaves open here is whether it is a matter of our happiness being “like” that of pigs in the sense that an art lover is just as happy at the art opening as a pig is, in filth, or if true happiness—materialist happiness, precisely—is *only* the latter kind.

Equally reductive but less dangerously immoral is Diderot’s comment in his correspondence that “there is a bit of testicle at the bottom of our most sublime sentiments, and our purest [feelings of] tenderness.”⁴¹ And throughout his work, but especially in the two essays devoted to the metaphysics of the senses (the *Letter on the Blind* and the *Letter on the Deaf and Mute*) and his various aesthetic writings, Diderot insists on the primacy of touch, which he also describes as “the most philosophical of senses” (in direct opposition to classical doctrines in which sight of

³⁷ Sade (1797–1801) in Sade (1976), 28–29.

³⁸ *Nouvelles ecclésiastiques*, 18 November 1758, 188, *cit.* Salaün (1995), 190.

³⁹ Thomson (2000) and Wolfe (2009).

⁴⁰ La Mettrie (1987), II, 286.

⁴¹ To Damilaville, 1760, in Diderot (1955–1970), III, 216.

course deserved that honor); he deplores the fact that “the hands are despised for their materialism.”⁴²

Whether or not all of this characterizes all forms of materialism, it does indicate a strong presence of embodiment: many forms of materialism prior to the later nineteenth century were not synonymous with “physicalism.” Again, my claim is not that every form of materialism was necessarily non-mechanistic or fully centered on embodied beings; but that any genuine understanding of a doctrine that in its early modern forms (and well until the early twentieth century) was often described as voluptuous (in the literal sense of pleasurable), should indicate that it is a far cry from what Friedrich Engels influentially described as “mechanistic materialism.” Indeed, it may be that there was no such thing.⁴³ Engels contributed what became for a long time an official story about materialism: that it was “predominantly mechanistic,” dominated by the science of mechanics, and thus reducing all organic processes to mechanical processes (with some ‘humanist’ implications regarding the dangers of reducing the human to the machine).⁴⁴

The same intuition is appealed to in twentieth- and by now twenty-first century “theory” as well: the idea that materialism is fundamentally *mechanistic materialism*, the reduction of all change to motion, and of all motion to mechanistic motion. Often this takes the form, terminologically, of an opposition between (good) materiality and (bad) matter or materialism: in a recent edited collection on ‘new materialism’, the editors write, “materiality is always something more than ‘mere’ matter: an excess, force, vitality, relationality, or difference that renders matter active, self-creative, productive, unpredictable” (Coole and Frost 2010, 9). I’ve mentioned several reasons why this is problematic at best, ranging from the problem of defining mechanism itself with respect to the body, to the various ways in which materialism does not accept strictly mechanistic accounts of body, whether it is because of its more fluid, passionate understanding of bodily function, or also its hedonism.

In contrast to this received view, we need to do justice to statements such as Diderot’s “of all the physical sciences to which one has attempted to apply geometry, it appears that there are none in which it penetrates less than in Medicine.”⁴⁵ Others, including Buffon and La Mettrie, concur in *denying* that the body is something that could be *mathematized*. One could call this “vital materialism.”⁴⁶ Diderot thinks mechanistic science is over and done with, a thing of the past, a completed cycle:

We are on the verge of a great revolution in the sciences. Given the taste people seem to have for morals, *belles-lettres*, the history of nature and experimental physics, I dare say

⁴² *Lettre sur les sourds et muets*, in Diderot (1975), IV, 15, 54. On the opposition between a materialism of touch and an idealism of sight, see Kambaskovic and Wolfe (2014).

⁴³ Kaitaro (2001); Wolfe (1999).

⁴⁴ Engels (1888) in Marx and Engels (1982), 278 (translation mine); in English in Marx and Engels (1959), 211.

⁴⁵ Diderot (1765), X, 221.

⁴⁶ Thomson (2001); Reill (2005); Wolfe and Terada (2008), Wolfe (2015) and Chap. 5 below.

that before a hundred years, there will not be more than three great geometricians remaining in Europe. The science will stop short where the Bernoullis, the Eulers, the Maupertuis, the Clairauts, the Fontaines and the D'Alemberts will have left it. ... We will not go beyond.⁴⁷

Diderot is opposing the new 'taste' and interest for a set of preoccupations including two forms of 'life science' (natural history and 'experimental physics') to the traditional prestige of mathematical science. And he is squarely locating his materialist preoccupations within the former. Yet at the same time this outlook is reductionist, as the example of animal spirits and the idea that "I am determined by the blood that flows in my veins" partly indicated. And, as I discuss further in Chap. 5, this reductionist outlook is part of the ethical dimension of materialism; what Adorno called its *demaskierende Tendenz*.

Recall Diderot's comment on Hemsterhuis: "wherever I read *soul* I replace it with *man* or *animal*."⁴⁸ This is a venerable trait of materialisms going back at least as far as Lucretius. The anonymous, clandestine tract of the 1720s entitled *The Material Soul* gives a very personal translation of a passage from *De rerum natura*, which becomes "the soul is to the body as scent is to incense"⁴⁹; we might say the soul here becomes a secondary quality of the body. La Mettrie is a little more aggressive:

The soul is just a pointless term of which we have no idea and which a good mind should only use to refer to that part of us which thinks. Given the slightest principle of movement, animate bodies will have everything they need to move, feel, think, repent and in a word, behave in the physical realm as well as the moral realm which depends on it (La Mettrie 1987, I, 98).

'Soul' for La Mettrie is the locus of mental activity, of which the brain is the physical substrate, not the metaphysical opposite of matter, or something that survives the body after death.⁵⁰

Is this reductionist or eliminativist? Contemporary terminology distinguishes between reductionism and eliminativism,⁵¹ both of which have a respectable materialist pedigree. Eliminativism holds that the soul and all of its properties that have been described and argued over from, say, Aristotle to Swedenborg *does not exist*

⁴⁷ *Pensées sur l'interprétation de la nature* § 4, in Diderot (1975-), IX, 30–31. 'Geometricians' should just be taken as referring to mathematicians. There are echoes here of Buffon's criticism, in the first discourse of his *Histoire naturelle* (1749), of our "over-reliance on mathematical sciences." Buffon, himself a trained mathematician before he moved into natural history, felt that mathematical truths were merely "definitional" and "demonstrative," and thereby "abstract, intellectual and arbitrary;" "just abstractions of the mind with no reality" (Buffon 1749, I, 53).

⁴⁸ Hemsterhuis (1964), 277.

⁴⁹ Anon (2003), 174. For more on this text and the concept of "material soul" overall see Wolfe and van Esveld (2014).

⁵⁰ The reduction of 'soul' to a psychological definition here prefigures Charles Bonnet's reworking of the concept in his 1755 *Essai de psychologie* (subtitled *Considerations on the Operations of the Soul*) and his 1760 *Essai analytique sur les facultés de l'âme*; Bonnet ends up using *âme* and *esprit* interchangeably. In the shift from 'soul' to 'mind' overall, the extent to which this process is strictly one of naturalization remains open to discussion.

⁵¹ Churchland (1989).

and indeed *none of these properties are real*; thus, what *is* real would be the brain, or the heart, or the stomach, and so on. Reductionism holds that the soul (to stay with the same example) is indeed not something that exists in any traditional sense; but notice that when La Mettrie, in the above quotation, says we really should only use the word to refer to “that part of us which thinks,” he is not saying mental faculties do not exist but that we need to rethink what their “seat” is, where they come from, and the extent to which they are independent from the rest of bodily processes, or not. However, he is not suggesting a weaker thesis, which would be that soul/mind might be autonomous in some sense but could be “defined in terms of” bodily processes. The forms of materialist embodiment discussed here share a commitment to reductionism, but not to eliminativism (although the extent to which this distinction is clearly applicable to the texts at hand is unclear).

4.4 Vital Materialism

We have seen that a major objection to materialism, or to any claim that it has a concept of embodiment, is the seeming absence of any “center” or “self” within the system of living parts. To be sure, as their fascination with the image of the beehive shows, a number of materialists—call them “vital materialists”—are deeply concerned with providing an account of the organism or body as something more than a set of interlocking, solid parts, although this “something other or more” is *not* understood as either “soul” or “vital force.” As titles of works such as *The Material Soul* convey, their goal is less to explain life in terms of the basic properties of matter than to give a material basis for life and animation. One can clearly see a Gassendist background here for this rejection of ‘merely passive’ conceptions of matter, in the sense that atoms have become tiny parcels of activity, in the wake of what Gassendi called, using a Lucretian term, *semina rerum*; the difference is that for Lucretius these ‘seeds’ were simply atoms, whereas for Gassendi they were composites or compounds of atoms.⁵² As the great Oxford neurophysiologist and natural philosopher Thomas Willis put it (bear in mind Willis was an admirer of the Epicurean tradition in general and of Gassendi in particular):

Atoms, which are the matter of sublunary things are so very active and self-moving, that they never stay long, but ordinarily stray out of one subject into another; or being shut up in the same, they cut forth for themselves Pores and Passages, into which they are Expatiated.⁵³

⁵²The term is from Lucretius, *De rerum natura* (Lucretius 1992) I, v. 501. See further Bloch (1971), 252, n. 75. On the shifting meanings of vital *minima*, notably ‘molecules’, in seventeenth-century chemistry, matter theory and philosophy see, in addition to Bloch, Clericuzio (2000), 63–71, and for the impact of *semina rerum* on early modern matter theory overall, Hirai (2005). None of this has decisive impact on the scholarly debate as to whether Gassendi was a materialist or not. For my purposes, he sets out a complex and influential ‘vital matter’ theory – and was taken to be doing so by authors including La Mettrie.

⁵³Willis (1683), ch. VI, 33. Gassendi in Bernier (1678), vol. V, book VI, ch. iii, e.g. 407–408.

If we no longer have an autonomous, immaterial soul controlling the motions of a mechanically defined body, we need a more unified—more “immanent”—picture of vital activity. This was observed quite sharply by Ménéuret, in his ambitious and programmatic article for the *Encyclopédie* on the “animal economy,” mentioned earlier:

That the soul is the efficient cause of phenomena because it is the origin of vital motions is not an undeniable truth. ... if our body was a brute, inorganic machine, it would necessarily have to be directed by some other agent, maintaining and powering its motions. And I do not think the errors of the mechanists stem from anything else: ... they do not hold animals to be living, organized composites.⁵⁴

Even a vitalist such as Ménéuret argues for an almost overlapping relation between “machine” and “body” in structural terms; here he describes the nature of living beings as a type of “composite” which cannot just be explained in terms of either constituent parts or motions.

But this “living and organized composite,” i.e., the organism might still be a “meat machine,” in the sense that it lacks a “self,” a “historicity,” both of which imply a certain kind of unity. Can the materialist sense of embodiment comprise something more than a history of impulses, drives and instincts, as is often claimed? Consider the following portrayal of materialism—which comes from a sophisticated treatment of Diderot:

Materialism as a working philosophy, used as a tool in the scientific investigation of the material universe, is appropriate and highly effective. Intended for the objective analysis and description of the world of externals, it yields disastrous results when applied to the inner, subjective world of human nature, thought, and emotions.⁵⁵

As we have seen, there is something gravely wrong with this picture. Soul, mind, intentionality needn’t be denied in favor of brute matter (or body), although the materialist has a variety of strategies at her disposal. One strategy—eliminativism broadly construed—is to deny that there is such a thing as the soul. Irritability and other basic physiological properties would then account for the visible phenomena that we attribute, falsely, to a purely mental agent, a “sailor in the ship” of the body.⁵⁶ Another strategy—reductionism of the more mechanistic and less embodied sort—is to say that “soul” and its processes are real inasmuch as they can be assimilated to or explained in terms of basic mechanical laws (d’Holbach: “our minds are subject to the same physical laws as material bodies”⁵⁷). Adding specifically ‘cerebral’ materialism to the mix does not produce a sharp result (as I discuss in Chaps. 6, 7,

⁵⁴ Ménéuret de Chambaud (1765), 364b.

⁵⁵ Hill (1968), 90.

⁵⁶ That the immaterial soul is in the material body like a sailor in a ship is something that Aristotle considers (*De Anima* II, i, 413a5) and Descartes rejects, without mentioning Aristotle, and sounding for all the world like a phenomenologist: “Nature ... teaches me, by these sensations of pain, hunger, thirst and so on, that I am not merely present in my body as a sailor is present in a ship, but that I am very closely joined and, as it were, Intermingled with it, so that I and the body form a unit” (Sixth Meditation, AT IX, 64).

⁵⁷ D’Holbach (1770/1781), reprint (1990), I xi, 220.

and 8), because the brain can be treated mechanistically, e.g. in a localizationist-type program to find the cerebral fibres matching associations of ideas (Hartley, Bonnet) or in a more plastic manner, as a chaotic, self-transforming system (Diderot).

It is not that the embodied materialist denies that our mental processes are subject to basic laws of physics (although there was very little talk of such laws at the time). Rather, the corresponding form of reductionism she defends, the *embodied* version, when presented with, say, the sense of self, or appetite, or desire, does not look for strictly mechanistic ways of explaining it but rather seeks to embed it in a general “spirited and bloody” account, employing medical, biological, physiological perspectives on what it is to be such a living agent. Thus Diderot does not assert that there is no soul, but rather that “I challenge [you] to explain anything without the body.”⁵⁸

4.5 Conclusion

If materialism is not merely mechanistic (or even mechanistic at all, or is such in an expanded, fluid sense far from Engels’ definition), but instead seeks to articulate an *embodied* account of mental life, will, action, etc., that doesn’t mean it will provide an account of intentionality or “first-person” states of experience that will satisfy everyone. But such states may in fact be nothing other than certain kinds of narratives or projections. Granted, some materialists, speaking about action, motivation and desire, describe us as if we were no better than pigs wallowing in filth. But where are these “disastrous results” when materialism turns to the inner life? Just because the materialist cannot go along with the holiness of Merleau-Ponty’s idea that “the mind does not use the body, but fulfills itself through it while at the same time transferring the body outside of physical space”⁵⁹ does not have to mean that materialist bodies are just piles of flesh, mere “aggregates” in the language of the period.

When I say “holiness” I have in mind Merleau-Ponty’s *mysticism of the flesh*, following an astute remark of Deleuze-Guattari’s⁶⁰: an out-of-control insistence on subjectivity, first personness, and opposition between flesh and body which goes as far as the sacralization of the living organism. Indeed, Merleau-Ponty’s is an explicit *metaphysics of transubstantiation*, for he equates the sensation of an embodied being to a mystical communion with divine presence: “Just as the sacrament not only symbolizes ... an operation of Grace, but is also the real presence of God ... in the same way the sensible has not only a motor and vital significance but is a way of being in the world ... sensation is literally a form of communion.”⁶¹ Merleau-Ponty also states this minus transubstantiation, appealing instead to the opposition between “third person” and “first person,” used, as so often, as an argument-stopper: he

⁵⁸Diderot (1994), 1282.

⁵⁹Merleau-Ponty (1962), 208–209 (trans. modified).

⁶⁰Deleuze and Guattari (1991), 168–169.

⁶¹Merleau-Ponty (1962), 212.

insists—in this more like a “vitalist” than a “phenomenologist”—that I am simply unable to understand the body if I think of it from an external standpoint, “therefore the body is not an object.”⁶² Mysticism is simply the stronger form of a recurrent trait of much embodiment discourse, its fascination with immateriality—something Terry Eagleton diagnosed amusingly, with regard to our obsession with embodiment and terror of biology:

Postmodernism is obsessed by the body and terrified of biology. The body is a wildly popular topic in US cultural studies—but this is the plastic, remoldable, socially constructed body, not the piece of matter that sickens and dies. The creature who emerges from post-modern thought is centerless, hedonistic, self-inventing, ceaselessly adaptive. He sounds more like a Los Angeles media executive than an Indonesian fisherman.⁶³

Is there such a thing as subjectivity for the materialist? If there is, it will be essentially synonymous with embodiment. Dreams, hallucinations, out-of-body experiences, and challenges to embodiment such as phantom limb syndrome are always traced back—for the materialist—to the interrelations of brain and body, desire and affect (as I return to in greater detail in Chap. 8). I hope it is clear that the materialist form of embodiment is not just the reduction of body to an entity in space amongst other entities. Yet at the same time, the materialist body is not the virtual, phantasmagoric body, nor the extraordinarily intimate and private body dear to phenomenologists. It has a unity and a continuity, *qua* organism, but it is a unity and continuity which do not rest on a foundational subjectivity, a “me-ness” which the inquirer or the scientist cannot grasp. In addition, as we saw with respect to mechanism and reductionism, the materialist does not fear the “componential” gaze upon the body. In response to the assertion of the concrete irreducibility of a living, experiential body, the materialist can always reply that a body is “only *provisionally* simple; it has remained undecomposed until now, but tomorrow may yield to a new means of analysis.”⁶⁴ Additionally, as La Mettrie wrote, “That the mind possesses such a corporeal nature need not be feared as a blow to our self-esteem.”⁶⁵ Instead, it fuels a fiery, sanguine *demaskierende Tendenz* proper to hedonistic, embodied agents.

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⁶² *Ibid.*, 198.

⁶³ Eagleton (2003), 186.

⁶⁴ Duhem (1902/1985), 50.

⁶⁵ La Mettrie (1747), 111.

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Chapter 5

Vital Materialism and the Problem of Ethics in the Radical Enlightenment

Abstract From Hegel to Engels, Sartre and Ruyer (Ruyer, *Revue Philosophique* 116(7–8):28–49, 1933), to name only a few, materialism is viewed as a necropolis, or the metaphysics befitting such an abode; many speak of matter’s crudeness, bruteness, coldness or stupidity. Science or scientism, on this view, reduces the living world to ‘dead matter’, ‘brutish’, ‘mechanical, lifeless matter’, thereby also stripping it of its *freedom* (Crocker LG, *An age of crisis*, Baltimore: Johns Hopkins University Press, 1959). Materialism is often wrongly presented as ‘mechanistic materialism’ – with ‘Death of Nature’ echoes of de-humanization and hostility to the Scientific Revolution (which knew nothing of materialism!), also a powerful Christian theme in Cudworth, Clarke and beyond. Here I challenge this view, by examining some ‘moments’ of radical Enlightenment materialism such as La Mettrie and Diderot (including his *Encyclopédie* entry “Spinosiste”), but also anonymous, clandestine texts such as *L’Âme Matérielle*, to emphasize their distinctive focus on the specific existence of organic beings. Second, I show how this ‘embodied’, non-mechanistic character of Enlightenment ‘vital materialism’ makes it different from other episodes, and perhaps more of an ethics than is usually thought (also via the figure of the materialist as ‘laughing philosopher’). Third, I reflect on what this implies for our image of the Enlightenment – no longer a Frankfurt School and/or Foucauldian vision of ‘discipline’, regimentation and order – but ‘vital’, without, conversely, being a kind of holist vitalism some scholars seek to oppose to materialism: vital materialism is still materialism. Its ethics tends towards hedonism, but its most radical proponents (Diderot, La Mettrie and later Sade) disagree as to what this means.

In the Introduction to this book I discussed different forms of materialism – most basically, a claim about the material nature of the universe, as distinct from claims concerning brain-mind relations (of the sort explored further in the final chapters of this book, notably concerning the ‘identity theory’ of brain and mind). But as regards the different possible ontological commitments of a materialist philosophy, I also suggested that we be careful in distinguishing a more ‘mechanistic’ type of materialism (whether this be of the sort influenced by the science of mechanics, or by appeals to analogies with automata, or a reductionist and/or eliminativist variety, in terms of basic properties such as size, shape and motion) from a more ‘vital’ or

embodied type, in which sciences such as medicine, physiology or biology serve as the ‘reducing theory’. This particularly materialist version of embodiment was discussed in the previous chapter, suggesting that materialist explanations should not be understood as reconfiguring organic individuals as statues or robots. A question that remains, to which I now turn, is: what kind of ethics can there be for ‘meat machines’?

5.1 Vital Materialism Again

If matter in such contexts was *vital*, “quick and bursting into birth” (in Pope’s phrase) rather than stupid or mechanistic, one might wonder, then, what Cudworth, More and others were targeting; in the English context it is of course Hobbesian materialism, which indeed possesses no particular vital emphasis, but even a generation later, the hostile reactions to La Mettrie’s *Homme-Machine* insisted equally on its cold, mindless, automatic character – basically a reaction to the title rather than contents of the book, which are a hundred percent organismic, so to speak, with no reduction of organic properties to the more basic properties of inorganic matter.

Yet this vital character does not mean that materialism here loses its *reductionist* character. A representative example is precisely in La Mettrie’s *L’Homme-Machine*, concerning the soul, as I mentioned in Chapter 4: “The soul is just a pointless term of which we have no idea (La Mettrie 1987, I, 98). Despite the fact that La Mettrie’s book is called *Man a Machine* it does not reduce living entities to the status of inanimate machines, as I tried to show. Not only could ‘machine’ be used in the French of the period to mean ‘body’; La Mettrie’s reductionism is a reduction *to the organic*. When he speaks of watches and springs – classic mechanist analogies – he is careful to point out that the object of his analysis, the body, is a “self-winding” machine (La Mettrie 1987, I, 69).¹ Notice that this kind of reduction is less focused on the ultimate nature of the space-time world and its physical components, and more on particular identities such as brain-mind or body-soul – which happen to be more ‘embodied’ or vital.

That this form of materialism is vital without losing sight of its demystificatory, reductionist aims leads, in my analysis to a further distinctive feature: it displays a ‘Rabelaisian’ tendency (in the sense analysed in Bakhtin 1984, of an impulse to reveal ‘lower’, corporeal and/or affective urges at the root of ‘higher’ socio-cultural formations) to *laugh at humanity*, particularly at social and ethical norms – a far cry from the materialism of D.M. Armstrong or David Lewis in the twentieth century

¹Vitalism and mechanism in the period are in fact entirely syncretistic compounds, hybrids of whatever ‘pure’ form of these concepts might have existed. Two examples: the vitalist Ménéuret speaks of the “human machine” as “a harmonious *composite of various springs*, each of which is impelled by its own motion but (which) all concur in the general motion” (Ménéuret 1765, 435b, emphasis mine); the anti-materialist Abbé Lelarge de Lignac speaks of the “organic resources on which the machine draws for its [self]-preservation” (Lelarge de Lignac 1760, I, 175).

(see Chap. 7). That this form of materialism laughs at norms can also be termed its ‘Democritean’ heritage, as discussed below (with reference to the figure of Democritus as the laughing philosopher). And thereby, it is not such a stranger to ethics, although it tends to be the enemy of social stability. As La Mettrie wrote presciently, “he who chooses man as an object of study must expect to have man as an enemy” (*Discours sur le bonheur*, in La Mettrie 1987, II, 269).

In other words, the excitement surrounding Radical Enlightenment materialism, even if it is not *strictly* unique to the period (one thinks of the impact of Lucretius’ *De rerum natura*), is nevertheless quite distinct from materialism in the twentieth and twenty-first centuries, where it seems to be something of an *ancilla scientiae*, a ‘valet’ of and conceptual clarifier for successful science. The materialism at issue here has an *ideological* but also an *affective* component which (a) is a *differentia specifica* of the Radical Enlightenment and (b) may, at least partly, put the lie to the enduring vision that materialism either is not an ethics, or is immoral.

One often reads that “it is impossible to reconcile ethics and materialism” (that quotation is in fact from an early, and important work on Diderot: Mornet 1941, 54). Or, just as blunt but somehow more complex-sounding: materialism “yields disastrous results when applied to the inner, subjective world of human nature, human thought, and human emotions” (Hill 1968, 90). In a way, we are still in the paroxysms of anti-materialism that identify matter, or materialism, with radical evil. Indeed, from Cudworth and – paradoxically, in political terms – Hegel, Engels and Sartre, to Hans Jonas and his disciple, the conservative bioethicist Leon Kass (2002), it is rare to find a denunciation of materialism that does not blend the metaphysical (like Raymond Ruyer’s “Le matérialisme est radicalement faux, et faux sous toutes ses formes” [Ruyer 1930, 42]) with the ethical.

Sometimes, faced with this verdict, well-meaning thinkers like Pierre Bayle come up with compromise or hybrid figures such as the ‘virtuous atheist’, namely Spinoza: didn’t he live an exemplary life?² Doesn’t this show that it is possible to be a materialist without necessarily being immoral? This is presumably what Diderot had in mind when he reacted thus, in his commentary on Hemsterhuis: “It would seem that libertinage is a necessary consequence of materialism, which doesn’t seem to conform in my view with reason or with experience” (Diderot 1994, 695). Materialism does not have to entail a Sadian pursuit of crimes against nature. Yet there is a problem here, since, even if it is not a *necessary* consequence, it certainly seems like a *possible* consequence (even without equating matter with fallenness and inhumanity, or materialism with “disastrous” applications to “the inner, subjective world of human nature, human thought, and human emotions,” as Emta Hill claims). But to his credit, Diderot correctly identifies the real problem.

²“Ceux qui ont eu quelques habitudes avec Spinoza, et les paysans du village où il vécut en retraite pendant quelque temps, s’accordent à dire que c’était un homme d’un bon commerce, affable, honnête, officieux, et fort réglé dans ses mœurs” (Bayle, article “Spinoza” in Bayle 1740, IV, 257); see also the partly analogous description of Vanini’s virtuous life and death in § 182 of the *Pensées diverses sur la comète*, in Bayle (1737), 117 (also § 174, 111); Israel (2001), ch. 18; more focus on Spinoza and Bayle in Dagron (2009), 193f. Diderot’s version of the virtuous atheist is presented in his late ‘tale’, the *Entretien avec la Maréchale de **** (Diderot 1994, 929f.).

Amongst the various eighteenth-century accusations against materialism, a typical one was that it reduced man to an automaton, an accusation made by Emperor Frederick the Great himself (whose patronage of La Mettrie did not imply full agreement with his views, in any case):

The principle of fatalism [*fatalité*] has dire consequences for society; if we grant it, we must consider men to be only machines, some made for vice, some for virtue – neither praiseworthy nor blameworthy on their own, and thus unable to be punished or rewarded: this eats away at morals, proper living and the foundations on which society rests.³

More precisely, the ‘automaton’ danger implied the charge of immoralism for the eighteenth century (when we worry today, or perhaps more frequently in the 1950s–1960s, about the effects of automation or the interplay between robotic labor and human labor, we do not normally think of immoralism as part of the problem). If materialist philosophy reduces humans to being “just” automata, it is then, in Richard Bentley’s terms, “the most slavish of systems,” a world of “mere matter, eternal sequel of causes,” a doctrine of “cabin’d fatalists, fetter’d Spinozists.”⁴

Immoralism was the real danger for apologeticists and other anti-materialists,⁵ for at least two reasons. First, because this was indeed an obvious consequence of the theory, as Diderot himself recognized. Second, because it was a consequence *embraced by* at least one prominent contemporary of Diderot’s: La Mettrie (to whom we can add the Marquis de Sade in the later decades of the century, unknown to Diderot; Sade actually considered La Mettrie to be one of his greatest predecessors, going so far as to compose a philosophical poem called “La Vérité,” The Truth ... and attribute its authorship to La Mettrie⁶). La Mettrie, in addition to claiming the term ‘materialist’ as a self-description, led, like some other contemporaries such as Count Alberto Radicati di Passerano, a life marked by a (courageous? foolhardy?) willingness to embrace radicalism, entailing a particularly sharp path of flight from persecution, first from France to Holland, then from Holland to Potsdam, at the court of Frederick II – a decision which we might see as desperate, and thus understandable, but was held against him by other materialists such as Diderot, who felt that seeking shelter from a despotic ruler was a direct contradiction to their values.

Before we turn to Diderot’s reaction, La Mettrie’s embrace of immoralism, but also its social and political ramifications, needs to be made clearer. I will suggest, somewhat dialectically, that its hedonistic, ‘swinish’ brutality does not exhaust the

³ Frederick II, “Examen critique du *Système de la nature*” (1770), in Frederick II (1985), 393.

⁴ Bentley (1713/1838), 386.

⁵ For some fascinating analysis of the ‘enemies of materialism’ in this period, see Chouillet, ed., (1993) and Masseau (2000).

⁶ “La Vérité, pièce trouvée parmi les papiers de La Mettrie” (1787), in Sade (1986). However, La Mettrie’s medical stance makes him explicitly amoral (or, concerned with an ethics of pleasure to which the doctor can contribute knowledge of the body); Sade is more of a reverse moralist, as has been said at least since Adorno & Horkheimer’s *Dialectic of Enlightenment*. In ‘La Vérité’ he speaks of ‘insulting Nature’ (Sade 1986, 553). Francine Markovits has also observed that in his works on pleasure such as *L’Art de jouir*, La Mettrie, contrary to Sade, does not put forth any ‘combinatorics of pleasure’.

ethical options available to the vital materialist in the Radical Enlightenment (notably, because some of these have adumbrations of either a ‘sympathy’ theory, and/or a Spinozist, relational ontology in which we are both cognitively and metaphysically interlinked with the rest of humanity, and thereby not solitary ‘wolves’ or ‘swine’). Yet this brutality, in its Democritean-Rabelaisian ramifications, is *also* a constitutive materialist ‘mode of access’ to the ethical.

5.2 La Mettrie and Diderot: Aporias of Materialist Hedonism

La Mettrie’s ethics, as presented in his *Discours sur le Bonheur* or *Anti-Sénèque*, is hedonistic, including in the non-traditional sense (consonant with his overall medical materialism) that it is about us organic beings, who can be understood better by the doctor than by the traditional moralist. He thinks the only kind of happiness we can pursue is an “organic, automatic happiness” (“le bonheur organique, automatique ou naturel,” La Mettrie 1987, II, 244) rather than what we might call an ideological happiness. That is, he rejects what he calls the “privative happiness” of the Stoics (239), which consists in fearing nothing and desiring nothing; its chief figures, in his view, are Seneca and Descartes. Privative happiness is opposed to “organic, automatic or natural” happiness, which is natural because “our soul has nothing to do with it,” and organic because it “derives from our *organisation*” (244). This happiness is automatic in the sense that it obeys the laws of operation of our ‘machine’ – which, as I have indicated above, is not to be confused with an ordinary mechanism, like a watch; but this does not make our behavior any more free, *stricto sensu*. Worse, it leads to a particular kind of determinism of our *urges*: “Wallow in filth like pigs and you will be happy like pigs” (286); of course, the subtle issue then becomes, what is the status of ‘like’ here? Is there room for what Mill was to call ‘higher pleasures’? Regardless, it was this aspect which particularly incensed his contemporaries (and delighted Sade).

La Mettrie was the object of an enormous amount of hostility, in his lifetime and up until the present. In addition to these proclamations about living like pigs, to which we can add a variety of other statements about the impossibility of really judging criminals, and the necessity of following our impulses (“these unfortunate ones ... were driven by a fatal necessity”: “we are not criminals by following the primitive motions which govern us, any more than the Nile is criminal when it floods”⁷), that La Mettrie died eating (or rather pursuant to a very abundant meal of an entire “pheasant pasty filled with truffles,” as Voltaire wrote to Richelieu in a letter of November 13th, 1751, two days after La Mettrie’s death), was one obvious proof that materialism was a philosophy for pigs. As late as 1969, his work was described as a “cynical appeal to gluttony, to libation, to the complete plenitude of

⁷ *L’Homme-Machine*, in La Mettrie (1987), I, 92; *Système d’Épicure*, § xlvi, in *ibid.*, 370.

the belly” (Velluz 1969, 112). Indeed, this hostility targeted his ethics more than his materialist metaphysics even if much of the rhetoric also focused on the ‘Monsieur Machine’ motif: a French Protestant historian of French literature in the mid-nineteenth century, Sayous, described him as a “lecherous (or sleazy) metaphysician of physical pleasure” (“métaphysicien lubrique de la volupté”⁸); the great naturalist Réaumur called him a monster and regrets that he died “in the horizontal position” (Letter to Formey, December 3d, 1751).

But most important for our purposes is that his fellow materialist Diderot declared that La Mettrie “died as he had to die, a victim of his own intemperance and madness; he killed himself by his ignorance of his professed art.”⁹ Indeed, Diderot did not just express a judgment of the intemperance of his fellow materialist, as if, perhaps, he (Diderot) was the more authentic Epicurean. He also denounced La Mettrie for claiming that “man was perverse by nature,” for reassuring the evildoer (*scélérat*) that he may commit crimes, and “le corrompu” (we would probably say ‘the pervert’) that he may “pursue his vices.” It is in this sense that La Mettrie was, for Diderot, “an author lacking the first idea of the true foundations of morals, ... whose principles would ... ensure immortality for the evildoer.”¹⁰

Now, La Mettrie was not just some prodrome of a dark prophet of desire, like Sade (or a more Pasolinian version of the same, a spokesperson for the libidinal energies of fascism): he was also an exceptionally honest writer, at the expense of his own safety and wellbeing: in the “Discours préliminaire” he composed for the edition of his complete philosophical writings, he declared unambiguously that “the more one is a philosopher, the more one is a bad citizen” (*Discours préliminaire*, in La Mettrie 1987, I, 18). Not only does this hark back to the venerable figure of Socrates; it also perfectly expresses sentiments Diderot had, and on which he wrote about in various places, albeit usually *more hidden* than La Mettrie. Diderot did describe himself as “a monster ... enough so to coexist ill at ease [*sc.* with others], not monster enough to be exterminated.”¹¹

Why is it important that Diderot parts ways with La Mettrie? Was it just mere cowardice? Unfortunately the situation is not that simple. One fairly accepted reading is that it was a tension between reformism and radicalism. That is, Diderot was upset by the nakedness with which La Mettrie expressed their otherwise common radicalism, fueled by a cheerfully destructive materialist project? In fact, there is a socio-political dimension to La Mettrie’s hedonism, which differs markedly from the reformist or revolutionary hopes of Diderot and his fellow radical *Aufklärer*. It is important to grasp that La Mettrie was not a political revolutionary: his is a *matérialisme de cabinet*. Sometimes it could be sarcasm: “I applaud your Laws, your

⁸ Sayous, *Histoire de la littérature française à l'étranger* (1853), cit. Leduc-Fayette (1979), 108.

⁹ *Essai sur les règnes de Claude et de Néron*, II, 6, in Diderot (1975-), XXV, 247 (see also the *Observations sur Hemsterhuis*, where he calls La Mettrie an “apologist of crime”). For more on La Mettrie’s death see Wolfe (2006); for more on the Diderot – La Mettrie tension see Kaitaro (2004).

¹⁰ *Essai sur les règnes de Claude et de Néron*, op. cit.

¹¹ Fragment now considered to be from a 1768 letter to Grimm, in Diderot (1955–1970), vol. 3, 188n.

mores, even your Religion, almost as much as I applaud your gallows and your scaffold” (*Discours préliminaire*, in La Mettrie 1987, I, 25). But other times, there is a clearly stated relativism: “Materialists may prove that Man is but a Machine, but the people will never believe it,” to which he adds a footnote:

What harm would there be, if they [*sc.* the people] did believe it? Thanks to the severity of the laws, they could be Spinozists, without society having to fear the destruction of its altars, which is where this hardy system appears to lead (La Mettrie 1987, I, 20).

Indeed, we should also acknowledge La Mettrie’s contempt for ‘the people’, which is often overlooked by commentators who think radical materialism necessarily comes with a radical politics. For instance, in his main work of medical ‘critique’ and satire, *L’Ouvrage de Pénélope ou Machiavel en médecine*, La Mettrie wrote in a section on the ‘politics of physicians’ that

At the dinner table, with friends ... one can and must laugh at (*se foutre de*, is stronger) the prejudices of the stupid Universe; but in public ... at the sickbed of a credulous patient, a physician needs more masks than those worn by the dancers in the opera *Isis* (La Mettrie 1748–1750, II, conclusion, 172).

That La Mettrie was courageously contemptuous of social norms and conformism does not necessarily make him a social reformer or a revolutionary (in contrast to figures such as the agrarian communist parish priest Jean Meslier¹² or more famously d’Holbach, for whom material equality as predicated on monism, necessarily meant absolute socio-political equality).

Moderates like Voltaire disliked the entire package: he observed after La Mettrie’s death that “There is a great deal of difference between fighting the superstitions of man and breaking the social bond and the chains of virtue” (Voltaire to Richelieu, January 27, 1752). Let me suggest that the materialist philosopher faced with the ethical is always in a space circumscribed by these two possibilities. The honour of the materialist is that she will always move towards the latter, she will always be *deflationary*, which is the analytic philosopher’s word for *destructive*. Adorno notices this: “Der Materialismus hat prinzipiell eine demaskierende Tendenz,”¹³ perhaps building on Hegel’s judgment that the reductionist tendency in French materialism is perhaps its most honorable feature: in his *Lectures on the History of Philosophy*, Hegel speaks of French materialism as “an astonishing and force of the Concept as directed against existence.”¹⁴

So why did Diderot attack La Mettrie? Diderot’s angst is that he agreed with the materialism (indeed, with the more specifically organic materialism and its frequent

¹²Meslier is acknowledged in the history of Communism – his name appears on a monument in Gorky Park in Moscow – and his ideas first circulated in an abbreviated, more conformist version thanks to Voltaire (his *Mémoire*, known for a long time as *Testament*, was written in the 1720s before he died in 1729). Meslier called for an end to private property and a transformation of nationalism into class warfare (Meslier 1970, II, 60–67), a “union of peoples” to fight against oppression (III, 140, 147) ... all while debating the Cartesian cogito, Malebranche’s occasionalism and a variety of versions of the ontological argument for the existence of God.

¹³*Philosophische Terminologie* II, (1974), 172, cit. in Benítez (1996), 307.

¹⁴Hegel (1895), vol. 3, 384.

appeals to medicine as a source of explanations of human behavior and norms: it was not La Mettrie but Diderot who wrote, “it is quite difficult to be a good metaphysician and a good moralist, without being an anatomist, a naturalist, a physiologist and a physician”¹⁵) but could not stomach the ethics and especially the relativism – although in the *Encyclopédie* entry ‘Locke’ Diderot defends the hypothesis of thinking matter, *also by emphasizing that* even if this hypothesis turned out to be true, it would change nothing in the workings of our juridical and social institutions.¹⁶

Diderot, too, thinks we are flesh-and-blood creatures with drives and urges, and that the ‘blood that flows in our veins’ (to use a popular image of the time, which both La Mettrie and Diderot employ) determines whether we will be a saint or a murderer, a genius or a fool. In his embodied reductionism, “the action of the soul on the body is the action of one part of the body on another, and the action of the body on the soul is again that of one part of the body on another.”¹⁷ There is an explicit Lucretian background here, notably to the discussion of ‘material soul’ in *De rerum natura*. For instance, Lucretius describes how, just as the scent of incense cannot be removed from the incense without its essence perishing, similarly the essence of the soul or mind cannot be extracted from the body without everything dissolving. They live, Lucretius says, of one life (III, 327–330). In an anonymous French work from the 1720s entitled *L’Âme Matérielle*, this is rendered in a more crisp form, closer to Diderot: “the soul is to the body as scent is to incense” (“L’âme est au corps comme l’odeur à l’encens,” Anon 2003, 174).

However, Diderot allows much room for our ‘modifiability’, as he calls it: our corrigibility by institutions and overall affective environment. While he is by no means a theorist of sympathy as a defining feature of our moral psychology, like Hume or Smith, Diderot has a strongly social concept of self, more so than La Mettrie: “He who has studied himself, will have advanced in the knowledge of others, given, I think, that there is no virtue which is foreign to the wicked, nor vice foreign to the good” (*Essai sur les règnes de Claude et Néron*, in Diderot 1975–, XXV, 226). Diderot’s vital materialism is more concerned with taking into account our ‘sentiments for others’, which brings to mind sympathy – a concept he uses, yet he almost never makes the move from an older, organic concept of ‘sympathies’,¹⁸ to a ‘Scottish Enlightenment’ focus on the moral psychology of sympathy.

¹⁵ *Réfutation d’Helvétius*, in Diderot (1975–), XXIV, 555.

¹⁶ Diderot (1975–), VII, 714–715, as noted in Nakagawa (1995), 28.

¹⁷ *Éléments de physiologie*, in Diderot (1975–), XVII, 334–335.

¹⁸ Cf. the *Encyclopédie* entry “Sympathie (*Physiolog.*)” by Jaucourt: “Il s’agit ici de cette communication qu’ont les parties du corps les unes avec les autres, qui les tient dans une dépendance, une position, une souffrance mutuelle, et qui transporte à l’une des douleurs, les maladies qui affligent l’autre. Il est vrai pourtant que cette communication produisait aussi quelquefois par le même mécanisme un transport, un enchaînement de sensations agréables. La sympathie, en physique anatomique, est donc l’harmonie, l’accord mutuel qui règne entre diverses parties du corps humain par l’entremise des nerfs, merveilleusement arrangés, et distribués pour cet effet” (Jaucourt 1765, 736a). The vast majority of occurrences of the term in the *Encyclopédie* are in a medical or chemical sense.

We could say Diderot has more of a *relational* ontology, both in general and when it comes to the individual (see below Sect. 5.4). This will prove to be an important conceptual resource for materialism as faced with the challenge of ethics, as we shall see below. But, as I suggested earlier, among the core characteristics of Radical Enlightenment materialism are also its unique brand of reductionism, which is not to be understood as a mere facilitator of scientific practice. And this uniquely corporeal reductionism is hard to separate from the darker side of the issue, which Diderot dislikes.

The Diderot – La Mettrie ‘debate’ is essentially about the key aporias of the Radical Enlightenment when it comes to ethics and materialism, but there is of course a third figure who represents something of a *terminus ad quem* or limit-case for the excesses of materialist radicalism in ethics: the Divine Marquis as Apollinaire called him: Sade. Following a now-established interpretive line that runs from Klossowski, Adorno and Bataille onto Simone de Beauvoir, Lacan, Angela Carter and Annie Le Brun, Sade can be seen as the actualization of a certain limit-possibility in the Enlightenment. In fact, Sade is a tricky character in this regard, for he effectively seeks to blend what I am calling the reductionist dimension with a kind of transcendental dimension, a negative theology, as Blanchot and Klossowski pointed out in the post-war years (Blanchot 1949/1963; Klossowski 1947/1967).

5.3 From the Libertine to the Laughing Philosopher: A Possible Ethics?

Consider the figure of the libertine. The libertine (i) borrows from proper materialist boilerplate on atoms, molecules, the electric fluid flowing within us (“pleasure is just the encounter of pleasurable atoms ... setting fire to the electric particles in our nerves,” our bodies are “electrified by libertinage”: *Histoire de Juliette*, in Sade 1998, 482, 184), (ii) suddenly turns this against nature with great vehemence (sodomy, all forms of non-reproductive sexuality), yet in the name of a kind of great abstract Nature with a capital N, a destructive nature, *mère marâtre* – and (iii) realizes that this has left no room for himself as an agent of destruction, and hence screams with pain and rage.

However (contrary to Klossowski), the operative issue in my view is not the theology of the Supreme Being in Wickedness, but rather how far the Radical Enlightenment can go on its immoralist journey or better put, how far it can take its constitutive materialism in an immoralist direction – precisely what horrified figures like Rousseau and Kant, who in that sense do belong to a ‘Moderate Enlightenment’. To be sure, Spinoza, La Mettrie, Diderot, Sade and Democritus ‘redivivus’ do not all teach us something uniform and consistent about materialism and the ethical (witness the tension even between Diderot and La Mettrie), but their example makes for a very different Enlightenment narrative from that emphasizing liberal, representative democracy, rights, republicanism and so on (see Negri’s

invigorating remarks on what he calls Spinoza's "anti-modernity," Negri 2004) – a more 'Kantian-Habermasian' narrative which curiously seems to have become predominant in Jonathan Israel's later writings.

The question is not whether La Mettrie, Diderot or Sade is right (after Wilhelm Reich, Herbert Marcuse and current appeals to a 'politics of affects' [Negri 1997; Citton and Lordon, eds., 2008], the jury is still out) but that materialism has a necessarily destructive component, or drive, or persona. It is important to notice, even if I can only mention this briefly, that this *destructive* moment, what Flaubert called "the cruelty of the anatomist," "dissecting a heart like a corpse" (in fact an old topos: one eighteenth-century critic of Locke's doctrine of personal identity, Matthew Prior, complained that Locke had "cut up" the soul "like an Anatomy"¹⁹), is not merely a moment of stating a formula as in classical reductionism, so that our subjective qualitative experience of things is replaced with a nice, impersonal third-person statement, as in 'Heat is the more or less violent agitation of molecules'. If it were so, this would not be negligible: it would count as a major articulation of naturalism; it would be 'science-friendly'. *But the materialist shouldn't be content with this*. If she is, then materialism will remain in the (legitimate, but restricted) role of a kind of handmaiden of science, an ideological bulldog in the fights with the enemies of science – except, and here La Mettrie's fate is really quite telling, the materialist is always sacrificed very quickly in these conflicts where, from Cudworth, Newton, Samuel Clarke and John Ray to William Paley and John Hedley-Brooke, we are always reminded that science does not itself countenance atheism.

If the reductive and destructive moment is neither just an apology of crime nor an ontological reduction to primary qualities or otherwise manageable physical entities and processes, what is it? Recall our brief allusions to the figure of Democritus, *the laughing philosopher*, and La Mettrie's bravado in declaring "he who chooses man as an object of study must expect to have man as an enemy" (*Discours sur le bonheur*, in La Mettrie 1987, II, 269). Elsewhere I have tried to analyse this figure of the laughing philosopher as the specifically materialist approach to the ethical (Wolfe 2007). One should bear in mind that our ability to laugh has sometimes been presented as a unique mark of the human, precisely, over and against a cold, mechanical, inhuman universe. As La Mettrie could have said to complicate matters when he was challenged, if we are just machines, what about laughter? Or: yes, we are just machines, but machines that laugh. The figure of Democritus as the laughing philosopher appears in one notable philosophical context, a letter from Spinoza to his correspondent Henry Oldenburg:

If this celebrated ancient who laughed at everything were alive today, he would undoubtedly die of laughter. For my part, these troubles neither make me laugh, nor make me cry; they incite me instead to philosophize and observe human nature better. For I do not feel that I have the right to mock nature, or even more, to complain about it, for I think that human beings, like all other beings, are just a part of Nature (letter 30, in Spinoza 2002, 844).

¹⁹Flaubert (1837), in Flaubert (1925), 254; Prior, *A Dialogue between Mr. John Lock and Seigneur de Montaigne*, 1721, in Prior (1971) vol. 1, 622.

That Spinoza wants to distinguish himself from the ‘ridentes’, the laughing one, is clear and a well-known point. But we should reflect on what this laughter implies: it is founded on naturalism – we are all parts of Nature – but instead of simply flowing into, say, a program for scientific investigation, it takes the form of a disturbing, destabilizing affect. Antonio Negri, a celebrated reader of Spinoza, has made much the same point in a different vocabulary: “laughter indicates the territory across which power, that is, the ontological dynamic towards the real, extends,” and he contrasts this ‘power’ with the way the Romantics “turned laughter into irony” (Negri 2009, 59–60, note C; translation modified).

Laughter here is not just some psychological or cultural phenomenon (nor a sign of human uniqueness). Rather, it is *reductionist laughter*. In a different letter, to the Gorcum magistrate Hugo Boxel, who was pestering Spinoza because of his (Boxel’s) firm belief in the existence of ghosts, Spinoza cites Democritus explicitly: “The authority of Plato, Aristotle and Socrates carries little weight with me. I should have been surprised if you had produced Epicurus, Democritus, Lucretius or one of the atomists ...” (letter 56, in Spinoza 2002, 903). That indicates that the difference between Spinoza and Democritus when it came to superstitions (in this example) was fairly non-existent. This reductionist laughter has political significance: Democritus served not only as a defender of the Enlightenment against all kinds of superstitions but was associated with social reform and revolutions, particularly during the French Revolution. We possess, from that period, a “Democritean hymn,” sung by the Francophile faction in Leiden to the tune of the Marseillaise, which ends on these unforgettable lines: “Strong be our link with France’s free terrain!/ Democritus’s good cheer must never, never wane!”²⁰ Indeed, Democritean good cheer is also Bakhtin’s laughter that ‘lowers and materializes’ (Bakhtin 1984, Introduction; discussion in Wolfe 2007).

Contrast this laughter from below with more ‘holistic’ praise for, literally, the top-down view (here, from the noted theoretical biologist Robert Rosen):

No one likes to come down from the top of a tall building, from where vistas and panoramas are visible, and inspect a window-less basement. We know, intellectually, that there could be no panoramas without the basement, but emotionally, we feel no desire to look at it directly; indeed, we feel an aversion. Above all, there is no beauty; there are only dark corners and dampness and airlessness. It is sufficient to know that the building stands on it, that its supports, its pipes and plumbing are in place and functioning (Rosen 1991, 39).

That the materialist laughs at human norms and values – at the fascination with “vistas and panoramas” – is different to simply reducing them to something more inert and formulaic, as became more common in the nineteenth century, e.g., Hyppolite Taine’s “vice and virtue are products just like vitriol and sugar” (Taine 1863, I, introduction, xv), that is:, every complex datum emerges out of the encounter of other more basic data on which it depends (the atomistic moment), as in Vogt’s slogan often repeated as ‘the brain secretes thought like the liver secretes

²⁰Anon., *Democritische Feestzangen, bij der eerste verjaaring der Revolutie van het Jaar 1795* [n.p.], 37: “Steeds beloelij’ ons vast Verbond met Frankrijks vrij gebied!/Hoezee! (bis) nooit flauw’ de pret in’t vrolijk Democriet!” (bis), cited in Lüthy (2000), 460.

bile', or "What we call the soul is simply the set of functions of the central nervous system"²¹ (about which I say more in Chaps. 6 and 7). The materialist is not (just) the anatomist of the heart or soul, à la Flaubert. That is, the radicality of reduction I am speaking of is not wholly synonymous with a kind of positivist neutrality.

Thereby, materialist laughter (or laughing materialism), not being a project to find *the* bio-chemical (neuronal, hormonal, genetic, etc.) formula or explanation for behavior, consciousness, morals, etc., also does not bind us in the "blind causal chains" in which Sartre thought materialism imprisoned us (Sartre 1990, 86). We may not want to be materialists about ethics, but it should be harder at this point to claim either that Enlightenment materialism was "mechanistic materialism," or that it was incapable of dealing the inner life of thought and emotion, or that the emergence of modern science meant, as Horkheimer suggested, that "Nature lost every vestige of vital independent existence, all value of its own. It became dead matter – a heap of things" (Horkheimer 1996, 359). Further, to laugh at superstition – or, less brightly, to acknowledge the limited control we have over our organic impulses – is different from literally being *blind to value*. This is different from simply claiming that materialism opens onto a Necropolis, a universe of dead matter, although we might surmise that it is a more subtle descendent of the latter view.

For instance, the idiosyncratic philosopher Raymond Ruyer attacked materialism for denying any kind of world of meaning or value in favor of a kind of diagrammatic schema of quantities and their interactions (see Chap. 1). It is curious that both dialectical materialists of the old-fashioned kind (including, for present purposes, Sartre in "Materialism and Revolution") and spiritualist thinkers such as Ruyer (who elsewhere argued for a return to teleology and final causes) give such an identical portrait of materialism as a historical episode. *Historically*, as I hope is clear by now, this portrait of dead materialism misses the vital character of the unique Radical Enlightenment formation we are interested in here. *Ethically*, it misses both the flesh-and-blood determinism of a La Mettrie and the more open organic vision of a Diderot, with its intimations of sympathy and affectivity. La Mettrie himself, in his willingness to blur the boundary between animals and humans and thus to deny that we should be considered in either sanctified or secular-sanctified terms as somehow bearers of the Moral Law, can also write affectively, in one of the various 'wild child' stories he makes use of: "We now know that there are in Poland kind mother bears who steal newborn babies left on church doorsteps by careless wetnurses, and raise them with as much affection and kindness as if they were their own children" [*Système d'Épicure*, § xxxv, in La Mettrie 1987, I, 365]]. But *metaphysically*, the dead materialism accusation misses something important, in addition: the ontology of relations.

²¹Vogt, "L'origine de l'homme," *La Revue Scientifique* 12 (1877), 1058, cit. in Pont (1998), 142. For a summary of the ideas of this school see Charbonnat (2007), 407–429.

5.4 Materialism as an Ontology of Relations

The radical Benedictine monk Dom Léger-Marie Deschamps, author of a massive atheist and materialist tract that was unpublished in the eighteenth century but that Diderot saw and admired, put forth what is probably the most extensive Spinozist ontology in the Enlightenment. Diderot wrote to Sophie Volland on August 31, 1769 speaking of Deschamps as an “apostle of materialism,” and, perhaps intimidated by the systematic character of the monk’s work, ends with an ironic twist, smirking at Deschamps’s belief that the “eternal order of Nature” could serve as a “sanction” for laws: Diderot 1955–1970, vol IX, 123). In his systematic work (the word is in the title) *La Vérité ou le vrai Système* (begun 1761, resumed and completed between 1770 and his death in 1774), Deschamps put forth an independently generated Spinozist metaphysics – something he felt materialism lacked in his time – in which “everything is composed mutually and ceaselessly in the whole” (Deschamps 1993, 404), “bodies are constantly incorporating one another” (382), such that “an entity is nothing other than the action of other entities upon it, and reciprocally, its action upon them” (345); “there is nothing that it does not contribute to composing, no composition it does not participate in” (227).

As Spinoza was probably the first to see (and the deepest), the experience that we belong to a fully causal universe, that we are parts (‘modes’) in this universe and nothing more (parts of Nature, as he wrote to Oldenburg) can also be extraordinarily liberating, in comparison with the inwardness or solitude emphasized by, amongst others, thinkers in a Cartesian vein. This kind of liberation was described quite well by Derek Parfit, in a personal-confessional mode, referring to the change that came over him once he began thinking about people in a reductionist way:

Is the truth depressing? Some may find it so. But I find it liberating, and consoling. When I believed that my existence was such a further fact [like a soul or something existing separately from one’s experiences], I seemed imprisoned in myself. My life seemed like a glass tunnel, through which I was moving faster every year, and at the end of which there was darkness. When I changed my view, the walls of my glass tunnel disappeared. I now live in the open air. There is still a difference between my life and the lives of other people. But the difference is less. Other people are closer. I am less concerned about the rest of my own life, and more concerned about the lives of others (Parfit 1985, 281).

This is what Spinoza describes as ‘common notions’, which make our persons – and, I might add, our minds – *common*. Common notions are conceptions of things “which are common to all” (*Ethics* II, proposition 38). There are common notions shared between bodies, and the more I ‘have’ or ‘know’ them, the more I have adequate knowledge of body, and more materialistically, the more my body has in common with other bodies, the more my mind is capable of perceiving things adequately (*ibid.*, proposition 39). The common notions allow us to step beyond the consideration of singular things and see (some of) the greater causal network beyond us: we then see how finite modes are produced by an infinite substance. If this sounds far removed from Diderot, consider this passage from an unpublished review he wrote in 1771:

the moral world is so intimately tied to the physical world that it appears both are really one and the same machine. You were an atom in this great whole, time will reduce you to an atom in this great whole. Along the way, you have undergone a variety of metamorphoses ... most importantly, that in which you walk on two feet, the only one which is accompanied by consciousness, the only one in which you constitute, through the memory of your successive actions, an individual called *myself*. Act so that this self will be honored and respected, by itself, by those who coexist with it, and by those who shall come later.²²

Of course, Diderot is adding here an anthropological dimension, that of the constitution of the person; but this is not foreign to Spinoza either.

5.5 Conclusion: On the Possibility (and Difficulty) of an Enlightenment Materialist Ethics

The materialist need not, then, restrict his or her ethical purview to “wallowing in filth like pigs” (La Mettrie) or resigning herself to her monstrosity (Diderot), if not downright applauding it (Sade). She can embrace a Spinozist ontology of relations (Morfino 2006), which makes the “walls of [our] glass tunnels disappear” (Parfit). And in this universe of interrelation and “constant composition” (Deschamps), there is room for praise and blame of the particular ‘ratio of motion and rest’ “which is accompanied by consciousness,” the only one in which the individual constitutes, through the memory of actions “an individual called *myself*” (Diderot again).

However, a normative ethics is ruled out, of course. To return to the Diderot – La Mettrie tension for a moment, we can easily imagine that La Mettrie, by writing the *Discours sur le Bonheur* (which began life as an *Anti-Seneca* produced despite the best intentions of Maupertuis, who had secured him a contract to write a biography of Seneca in the hopes of downplaying his fellow *malouin*’s bad reputation), gleefully affirms this destruction of normativity. Diderot is less cheerful:

I am convinced that, even in as badly ordered a society as ours, where the success of vice is often applauded, whereas the failure of virtue is ridiculed – I am convinced, then, that the best way for us to achieve happiness is by doing good; this is the most important and interesting work, which I shall recall with the greatest satisfaction in my final moments. It is a question I’ve meditated on a hundred times ...; I had all the data I needed; should I admit this? I never even dared take up my pen to write the first line. I said to myself: if I do not emerge victorious from this attempt, I shall become the apologist of wickedness, I will have betrayed the cause of virtue, and encouraged man towards vice. No, I do not feel up to this sublime labor; I would devote my life to it, pointlessly (*Refutation of Helvétius*, in Diderot 1975–, XXIV, 589).

Diderot wanted to write a work of moral philosophy but abandoned the project because if it had not been (intellectually) successful, he feared that he would then become an “apologist of wickedness,” thereby betraying “the cause of virtue”;

²²Diderot, *Dieu et l’homme* a review of Pierre-Louis Sissous de Valmire, *Dieu et l’homme*, Amsterdam (Troyes), 1771, intended for the *Correspondance littéraire* but unpublished, in Diderot (1975–), XX, 655–656.

contrary to La Mettrie or Sade, he did not want to ensure “the immortality of the evildoer.”²³ Diderot might have derived some comfort from Locke, for whom it is by no means a failure to not write moral philosophy, but instead, a positive ethical sign. Locke wrote, in his recommendations for the education of the son of his friend Lady Peterborough, that the young man should read Livy (for history), along with geography and the study of morality. But, he explained, “*I mean not the ethics of the schools,*” but rather Tully (i.e. Cicero), Pufendorf, Aristotle and “above all the New Testament,” wherein “a man may learn how to live which is the business of ethics, and not how to define and distinguish and dispute about the names of virtue and vice.”²⁴ Works of professional moral philosophy were the worst way to go. But Diderot did write brilliant works in which a (home-grown, constructed) Spinozism is at work, also integrating the new discoveries and conceptual shifts in the life sciences (Wolfe 2014).

Yet if we only emphasize this openness to relations and transformation, we miss or omit the shocking component, the ‘*destructive moment*’ as I have called it. For if we seek to hygienically isolate the La Mettrie situation as a ‘mad dog’ episode of materialism, we lose sight of what is unique in the reductionism. From Lucretius, Hobbes and La Mettrie onto Cabanis, Vogt and the Churchlands, reductionism is not something the materialist keeps in a closet. And as noted, the reductionism here is corporeal, or even carnal – but *qua* reductionism (whether from soul to body, from free will to organic determinism, or from values and norms to medico-materialist concepts), its presence implies that the specifically *vital* dimension should not, conversely, be taken in the direction of a kind of holist vitalism; vital materialism is still materialism. And in its radical dimension, it is capable of *laughing* at humanity (Democritus, La Mettrie). Presumably, only warm-blooded creatures with hearts, livers, brains and therefore emotions, do laugh.

Of course, not all materialists would agree with this emphasis on the *biological*, since it seems to perturb the standard identification of materialism with physicalism; some reduce all causes to physical causes, like Hobbes and d’Holbach. But, to put it briefly, what this ‘biologism’ allows for is a combination of the power of reductionist explanation and a recognition of the ‘unpredictability’ of Life – a kind of *matérialisme aléatoire*, the classical figure of which was the monster (Wolfe 2005). Unlike, say, the teratologist Isidore Geoffroy Saint-Hilaire in the early 1800s, Diderot does not seek to demystify the ontological status of monsters by providing a quantitative analysis of their parts and the processes of generation which brought them about. Instead, he remains fascinated by their *destabilizing* potential, as wholly natural beings who are also *contra naturam*.

Radical Enlightenment materialism is more of an ‘uncertain materialism’ (*matérialisme aléatoire*, in the late Althusser’s phrase: Althusser 1994a, b, 2005) than a

²³Diderot, *Réfutation d’Helvétius*, in Diderot (1975-), XXIV, 589; *Essai sur les règnes de Claude et de Néron*, II, 6, in Diderot (1994), 1119.

²⁴Locke to Cary Mordaunt, 1697, first reproduced in King (1829), 5–6, also cit. in Ashcraft (1991), 235, emphasis mine; much the same idea is present in Locke, *Thoughts Concerning Education*, § 185 and *Reasonableness of Christianity*, §§ 241–242.

search for laws of nature and other forms of ultimate order. Yet its destructive, destabilizing tendencies – its “demaskierende Tendenz,” in Adorno’s words – are not always foreign to the project we might call ‘science’: La Mettrie memorably calls for what we would today think of as the recognition of clinical (whether bodily and/or psychiatric) factors in judging the actions of a criminal: “It would doubtless be desirable for there to be only excellent Doctors to serve as Judges, for only they could distinguish the innocent from the guilty criminal” (*L’Homme-Machine*, in La Mettrie 1987, I, 91). But doesn’t this only serve as a temporary way of distinguishing between individuals, condemned to sink back into the organic ‘piggishness’ we saw earlier? Not if the materialist appeals to a Spinozist, relational ontology. Nor if she reflects on our existence as affective beings. Machines don’t laugh, and laughter at norms is not synonymous with delectation in crime.

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Chapter 6

Naturalization, Localization: A Remark on Brains and the Posterity of the Enlightenment

Abstract From the Enlightenment to philosophy of mind in the mid-twentieth century, two distinct trajectories can be distinguished, both of which are relevant to our story in different ways: the development of experimental neuroscience, and the gradual recognition that materialist philosophy should concern itself with the status of the brain. If classically, materialism as a thesis about the world was distinct from materialism as a brain-mind theory, some historical cases complicate that distinction, such as the debate on Locke on thinking matter. But nevertheless, it is a very operative distinction (also made by eighteenth-century critics). How do we get from that, to the ‘vulgar materialism’ of the nineteenth century (Vogt, Moleschott, but already Cabanis in 1800), with the idea of the brain secreting thought? And how, from that, to brain-mind reflections in the twentieth century? I can only suggest some pathways ...

In earlier chapters, I emphasized a difference between more *embodied* forms of materialism and more *mechanistic* forms, which did not do justice, or at least did not see the specificity of, embodied (or biological, or organismic, depending on which issue is central) agents. I also noted, in the Introduction to this book, that it was important to distinguish between materialism as a claim about the nature of reality or the physical universe, and materialism of a more ‘psycho-cerebral’ sort, focusing on brain and mind. In fact, when we turn to the identity theory of mind in the next chapter, a paradoxical aspect I mention, which has not been discussed much in the secondary literature, is that its arguments concerning the relation between cerebral processes and mental processes are chiefly inspired by developments in physics!

But how do we get from a world of ‘modern Epicurean’ monsters, scandalous medical materialists professing an ethics of pleasure or for that matter, very conceptual reflections on the brain (like Toland and Collins’ in the early years of the eighteenth century, which don’t appeal to experimental evidence¹), to a recognition of

¹ Toland (1704), IV, § 7, 139; Collins, *Reflections on Mr Clarke’s Second Defence*, in Clarke (1738), III, 818. Seventy years later, Priestley reiterates these claims, again as a conceptual point without empirical detail: “I rather think that the whole man is of some *uniform composition*, and that the property of *perception*, as well as the other powers that are termed *mental*, is the result (whether necessary or not) of such an organical structure as that of the brain” (Priestley 1775, xx).

the experimental, conceptual and even ontological challenges presented by the brain? I will suggest two distinct yet occasionally overlapping, and complementary paths of development: the naturalization of the soul and the shift towards the localization of mental functions.

6.1 The Naturalization of the Soul

The question of the soul is approached in various ways within the materialist context. With thinkers such as La Mettrie and Denis Diderot in the mid-eighteenth century, we are dealing with an intellectual context that is significantly influenced by the Epicurean and more generally heterodox traditions in which the soul is treated as material and/or mortal in a variety of different ways. La Mettrie himself changes his view on the soul, as Ann Thomson has noted (Thomson 2008, 188), from a more Epicurean view of a “fiery soul” to a model we would more immediately recognise as materialist, in which thought is the emergent property of the material arrangement of the brain. But even within the Epicurean tradition, both of these views exist: a fully substantialist view of soul in material terms, and a reductionist view which makes soul, if it exists at all, a functional property of a particular material arrangement.

More interesting to me is that this shift can also be seen in broader terms as a shift within *reductionist* strategies, which we can also classify as *types of reduction*. There is the classic, full-scale reductionist approach, which might be most familiar to a modern reader. This can vary from La Mettrie’s statement in his *Traité de l’âme* “s/he who wishes to know the properties of the soul must first search for those which manifest themselves clearly in the body” (which, one may notice, is not a statement that *there is no such thing as the soul*, but rather the advice to start with the body), to hard-line denials, such as the dismissive comment in the article “Physiologie” in the *Encyclopédie*: “If the body is healed, one need not worry about the soul.”²

Mostly, soul is being reconstrued as a functional definition: it is neither eliminated in favour of a hypothetical ‘basic physics’ or the properties of matter in general, nor asserted as unique in its own right. But more often, in this type of reduction we find either the weaker denial that the soul could be relevant at all to medicine, as in the (vitalist!) Ménuret’s statement that the soul is not “based on any medical observation; hence we will not mention it in this purely medical article, in which we will restrict ourselves to describing the changes of the body”,³ or a stronger denial that there is no such thing, period, as in d’Holbach: “You speak of your soul but do

²(Rather loosely rendering “Qui a guéri le corps, ne doit pas s’inquiéter de l’âme” in the article “Physiologie”: Anon., 1765, 538a).

³Ménuret de Chambaud (1765), 718b.

you know what a soul is? Can't you see that this soul is merely the assemblage of your organs, from which life results?"⁴

A locus of cognitive functions which has been so thoroughly naturalised that it is open to manipulation is, of course, rather like 'mind' from the psychologist's point of view, something the Epicurean physician Guillaume Lamy casually points to when he says "I used the words *soul* and *mind* interchangeably ... because they are the same thing."⁵ Ultimately, whether these forms of reduction are weak or strong, coherent or wavering, they share a common feature: they are not the reduction of the soul to matter in motion, or to inanimate atoms. When Diderot writes "wherever I read *soul* I replace it with *man* or *animal*,"⁶ he is encapsulating in a phrase a process of conceptual crystallisation that has been underway at least since the clandestine treatises of a century earlier. It is, on the one hand, a medicalisation of metaphysics, in the sense that medical knowledge and observation is allowed to modify metaphysical claims (a process that can be traced back as far as the reception of Aristotelian natural philosophy and the emergence of humoralism, both in the sixteenth century). But it is also, on the other hand – and of course partly due to this specifically medical context – a reduction to *body* (as discussed in Chap. 4).

But what of the brain? Indeed, the forms of naturalization of the soul discussed above can be seen, *if considered from the standpoint of twentieth-century discussions of mind-brain identity*, as a version of such searches for correlation and/or identity, as is explicit in authors including Anthony Collins, La Mettrie and Diderot, and Joseph Priestley. But this does not mean that the relation materialism has to the brain is univocal. For one thing, some of the forms of reduction are more *to the body*. For another, a materialist who asserts that 'the brain thinks like the liver secretes bile' is not necessarily expressing great sensitivity to the particular characteristics of the brain, including its plasticity. A question might then be: can the materialist do justice to cerebral plasticity? (Wolfe 2015a). (And this should remind us of the tensions between mechanistic materialism and a more embodied materialism, as well as looking forward to my reflections on phantom limb syndrome in Chap. 8).

It might then be profitable to try and sketch out shifting materialist attitudes towards the brain. For now, I can only suggest some indications. Crucially, knowledge about the brain was gradually presented as a legitimate source of knowledge (or knowledge constraint) about the mind. Hence the boundary between 'mental' or 'cognitive' states and 'physical' states was often blurred. Minimally, knowledge of the brain was a constraint on knowledge of the 'soul', and the soul was not independent from the brain. This led to localizing thought to particular features and functions of the brain, not to generic features of matter or the body as a whole. For example, Diderot claimed that "Man's key characteristics lie in his brain, not in his

⁴D'Holbach (1774), I, XCIV, 92.

⁵Lamy, *Explication* (1681), ch. VII (conclusion), in Lamy (1996), 176. He adds, in a technical flourish which seems rather dated now, that he is using 'mind' primarily for "the portion of the Soul contained in the nerves," and 'soul' for the "spirits contained in the brain" (*ibid.*).

⁶Hemsterhuis/Diderot (1772/1964), 277.

external constitution” (*Elements of Physiology*, in Diderot 1975-, XVII, 326) and described the brain as a highly plastic, modifiable entity:

The soft substance of the brain [is] a mass of sensitive and living wax, which can take on all sorts of shapes, losing none of those it received, and ceaselessly receiving new ones which it retains. There is the book. But where is the reader? The reader is the book itself. For it is a sensing, living, speaking book, which communicates by means of sounds and gestures the order of its sensations (*ibid.*, 470).

This process can be understood as one of naturalization of the ‘soul’,⁷ as just that material organ or part of us which thinks. From there it is a small step to Vogt’s infamous early statement of brain-mind identity, which I have cited more than once. The context there, curiously, was not particularly any work in neuroanatomy but rather biochemistry, and the sense that all organic functions, including thought, could be subsumed under a kind of broader chemistry of life. This was the *Vulgärmaterialismus* of the nineteenth century with Vogt, Moleschott, Büchner and Czolbe. But here, critics of materialism could justifiably feel that reductionism had lost a sense of nuance (the kind of nuance that was on display in Diderot as cited above), and was confusing categories. A clear diagnosis of such confusion, regarding Vogt’s infamous early statement of brain-mind identity, was given by the great nineteenth-century scientist Emil Du Bois-Reymond. The problem with brain-mind identity should not be reductionist identity claims *per se*, Du Bois-Reymond suggests, but the confusion of genres:

Take Carl Vogt’s bold expression, which in 1850 introduced a sort of mental tournament: “All those capacities which we call mental activities are only functions of the brain; or, to use a rather homely expression, thought is to the brain what the bile is to the liver, or the urine to the kidneys.” The unscientific world was shocked at the simile, considering it to be an indignity to compare thought with the secretion of the kidneys. ... Vogt’s expression [is not] worthy of blame because it represents mental activity as being the result of material conditions in the brain. Its faultiness [is] that it leaves the impression ... that the soul’s activity is in its own nature as intelligible from the structure (*Bau*) of the brain, as is the secretion from the structure of a gland.⁸

That is, the problem is not (true or false) scientific claims but a categorical confusion (in Du Bois-Reymond’s mind, clearly between a more epistemological notion of Kantian provenance and an empirical notion). But at the time Du Bois-Reymond was writing, a separate development was underway, which had its own impact on the history of materialism (and reflections on the brain).

⁷I use this expression more loosely than Martin and Barresi (1999). For my version of events as regards the emergence of psychology and how it relates to materialist discussions of the soul, see Wolfe (2015b).

⁸Du Bois-Reymond (1874), 31–32 (emphasis mine).

6.2 Localizing Mental Functions

The localization of mental functions in parts of the brain has been described as the closest meeting-point of experimental natural science and core issues of human nature, including the mind-body problem (Young 1970/1990, vi) – which does not have to imply either strict identity or materialism. But rather than reflect at that level of generality, I will simply note, following Métraux, that in this nineteenth-century context “most physiologists, physicians, and naturalists would to a large measure agree that, whatever the function embodied and instantiated by some organ, the activity of this bodily part resided, or had its proper place, in the portion of living matter by which it was subserved.”⁹ One can see this clearly in the very title of the 1870 address given by the physiologist of colour perception Ewald Hering on “memory as a general function of organised matter” (Hering 1870). Yet the one place or site where the correlation of bundles of matter and functional properties was not clear was the brain.¹⁰

Franz Joseph Gall (1739–1828) sought to correlate detailed anatomical descriptions of the brain with morphological features of the skull covering the brain, and with observations relating to the physical, hence measurable, nature of mental and moral faculties in man – what he called ‘organology’ and his colleague Johann Spurzheim termed ‘phrenology’, the more enduring term.¹¹ The idea is that each mental faculty possesses its ‘organ’ (Spurzheim called the brain “a collection of many peculiar instruments,” Spurzheim 1815, 106), the development of which could be analyzed by examining the external contours of the skull. Put more subtly, Gall’s approach to brain and mind consists in the following key points¹²: (1) the brain is the material organ of the mind; (2) there is a more or less strict proportion between the volume of the organ and the power of its mental manifestations, which is the expanded version of the phrenological tenet that there exists a correspondence between each mental function and a given part of the cortex; (3) the use of the mental faculties promotes the development of the cerebral organs; (4) the features of the mind are determined by the configuration of the brain; (5) the brain is a multiplex organ, composed of a definite number of compartments, each of which reveal itself to be the seat of a propensity, sentiment, or intellectual faculty.

⁹Métraux (2000), 164.

¹⁰But most of the time – in Diderot, Lamarck, and Cabanis, amongst others – the brain was not presented as an ontologically problematic organ, but rather as one organ amongst others. As Métraux notes, Lamarck describes mental phenomena as “exclusively organic, and hence entirely physical” (Lamarck 1988, 166). For Diderot, who is not always consistent on the issue, “Le cerveau est un organe comme un autre” (*Éléments de physiologie* and “Fragments dont on n’a pu retrouver la véritable place,” in Diderot 1975-, XVII, 240, 467).

¹¹Gall, for theoretical as well strategic reasons, explicitly rejected the name ‘phrenology’; cf. Hagner 1997, 99–118; House (2010).

¹²Gall, cited in Clarke and O’Malley (1968), 477; Young (1970/1990), 12; Hagner (1997), 89–118; I am particularly indebted to the summary in Métraux (2000), 167.

This was materialism in a socially scandalous sense – a construction of brain-mind materialism in a particularly socially and ethically deterministic sense. In December 1801, Emperor Franz II issued a decree banning Gall from publication and holding public lectures in Vienna. The main reason given for the decree was indeed the danger that his theory could “lead to materialism and thereby go against the ‘first principles of morality and religion’” (House 2010, 42). But aside from the social controversies, what is happening here – and also in French clinical brain research of the period (Flourens et al.), is that the human mind is gradually becoming conceptualized – in spaces ranging from laboratories to hospital wards – as “a set of functions instantiated by spatially circumscribed and mutually connected portions of neural matter” (Métraux 2000, 183). In that sense, phrenology and parallel projects in psychology and early neuroscience, despite their partly nefarious overtones in their more ideological dimensions, are important either because they explicitly articulate and defend a form of materialism about the relation of mind and brain, or even as they deny the relation between cerebral localization and (philosophical) materialism, they nevertheless demystify the hitherto sacred interiority of the mind. For a long time criticisms such as Hegel’s comment that ‘Spirit is not a bone’ in the *Phenomenology*¹³ were taken as definitive; but with later forms of materialism (including the IT) this dimension returns. However, as I discuss subsequently including in the Conclusion to this book, it is not straightforwardly the case that materialism emerges in twentieth century out of, say, neuroscience.

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¹³Hegel (1905), II, 252.

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Chapter 7

Materialism in Australia: The Identity Theory in Retrospect

Abstract I suggest a historico-philosophical overview, assessment and explanation of the variety of materialism that was developed from the late 1950s onwards in Australia, primarily by U.T. Place, J.J.C. Smart, and D.M. Armstrong. These authors spoke less of “materialism” and more of an “identity theory,” that is, a theory concerning the nature of the relation between brain and mind – not matter and mind in general, notice – which they wished to show was an “identity.” In order to explain, survey and assess this intellectual episode I examine some of its roots in the Vienna Circle (its closest ‘correspondent’ in the United States was Herbert Feigl, who had been a member of the Vienna logical positivists), the way in which it reacted to behaviorism, and its ‘success’ in Anglo-Saxon philosophy of mind in the years since then. Having done so, I evaluate the pertinence and novelty of this kind of materialism in relation to philosophical materialism more broadly defined, and this will lead me to formulate some criticisms of the Identity Theory.

7.1 Introduction

The history of materialism as seen from a ‘Continental’ standpoint consists, most often, of three or four episodes: (i) the supposedly mechanistic materialism of the post-Cartesian era which flourished in France in the eighteenth century; (ii) ‘historical’ or ‘dialectical’ materialism, in which the ‘naïve’ naturalism of the French materialists was replaced with a more solid social and economic grounding; (iii) one thinks back to earlier thinkers such as Democritus and Lucretius, or of more tenuous forms of materialism as found in Hobbes (explicitly) and Spinoza (implicitly, on some readings). In the Euro-centric histories of philosophy, the last possible upsurge of this strange, crude, vulgar, reductionist, scientific, anti-religious,¹ immoral form of thinking was with the German “vulgär-Materialisten” of the mid-nineteenth century, genuinely ‘crude’ thinkers such as Moleschott, Vogt and Büchner, who sought to assert an extreme ‘bio-chemical’ reductionism against the pervasive Hegelianism

¹With the rare exception of the British “mortalists” in the late seventeenth century, to whom Hobbes and Joseph Priestley are closest of the more canonical philosophical figures: mortalists believe in the compatibility of Christian doctrine in its Puritan reduction, with a materialist account of the human body in which the soul dies with the body (hence they are “mortalists”).

of their environment. Then, by a mysterious leap of Spirit, Thought usually passes on to Husserl and Heidegger, or Frege and Wittgenstein if one is so inclined. Materialism will then be represented at best by the rather annoying proclamations of scientists—their “spontaneous philosophy,” as Althusser called it (Althusser 1974)—who seek to reduce human existence to easily manageable packages of rules and events, such as the DNA map, or ‘neuronal man’. The late Marc Jeannerod warned that it would be ‘dangerous’, in any case bad for science, to “leave subjectivity to the philosophers” (Jeannerod 1983, 121)—maybe not such a bad idea, when one sees what philosophers have done with the idea in the twentieth century, but unfortunately Jeannerod implies that a *good* explanation of subjectivity would be strictly causal, and thus he brings us to back to ground zero.

The picture looks quite different for analytic philosophers, for whom materialism primarily means the identity theory of brain and mind (hereafter IT), put forth originally between the late 1950s and the early 1980s by three native or adopted Australians, U.T. Place, J.J.C. Smart and David Armstrong, along with ‘fellow-travellers’ Herbert Feigl and David Lewis in the United States.² Yet here too national parochialism could play a role: the most Australian of the Australian materialists, D.M. Armstrong, commented on the rather scornful attitude he experienced at the hands of English ordinary-language philosophers as follows: “the common response to the identity theory in the English-speaking world was to say ‘A touch of the sun, I suppose’.”³ In contrast, Smart positions the ‘school’ to which he belongs squarely in the mainstream: when discussing forms of materialism he regards as unattractive mutations, such as emergentism, panpsychism and hylozoism (the Vienna Circle thinkers would have said vitalism), Smart adds rather coldly that the form of materialism mainly discussed by “*professional* philosophers in the English-speaking world” (!) is “extreme physicalist Materialism.”⁴

²After the IT, the Australian materialists went on to produce influential work in other areas (besides, of course, returning to it and suggesting emendations over the years). Smart wrote several important essays on the philosophy of time, color, a rather premonitory book on scientific realism, and also ventured into utilitarian ethics, as well as that perennial hobby of materialist philosophers, debating with religious believers (Smart and Haldane 1996). Armstrong produced a major metaphysical theory of universals and laws of nature. But the identity theory also played a significant role in philosophy of mind and the newer field of philosophy of neuroscience in more recent decades (Polger 2011), despite, ironically, the absence of neuroscientific evidence in the IT argumentation, as discussed below.

³Armstrong, “Preface to the Paperback Edition,” in Armstrong (1993), xiii. For an interesting way of extending this tension between a British ‘anti-metaphysical’ stance (of the time) and Armstrong’s monistic ontology, see Campbell (2012).

⁴Smart (1974/2000), where Smart also makes a stab at an ‘inter-cultural’ vision, briefly surveying “Eastern Materialism”: “This historical survey has been concerned with Materialism in Western philosophy. On the whole, Materialism is contrary to the spirit of both Indian and traditional Chinese philosophy, though the Carvaka school of Materialists flourished from the 6th century BC until medieval times in India. Mention should also be made of the strong naturalistic tendency in Theravada Buddhism, as also in certain schools of Chinese philosophy that exalt ch’i (‘ether’ or ‘material force’) above principle and mind” (*ibid.*).

There may be a gulf between ‘materialism’ and its specifically Australian variant, the *identity* theory of mind and brain, or consciousness and the brain, or sensation and ‘brain processes’, but if we reflect on the origin of the two expressions we see an affinity: in the seventeenth century, “materialists” originally referred to pharmacists (purveyors of the *materia medica*), and the term “identity theory” was first used by the ‘reductionist’ psychologist Edwin Boring, in a 1933 work⁵ subsequently quoted by Place, who of the three founding figures of the IT was the one most interested in psychology. However, the IT is much less ‘empirically’ (in this case medically) oriented than most earlier forms of materialism; as I discuss below, it is more *conceptual*. One further comparative remark is that this form of materialism has effectively *eliminated* from its purview, from its scope or concern, *any concern with ethical or political matters*⁶ (contrast the ‘Radical Enlightenment’ materialism discussed in Chap. 5).

With the exception perhaps of the German ‘episode’ mentioned earlier—and even that had a certain association with Socialism conceived of as a program ‘friendly to science’ and hostile to conservative religious ideologies, in a similar way as the Vienna Circle did fifty-some years later—it is safe to say that *all* forms of materialism hitherto have included this dimension, in different ways.⁷ It can be as a *consequence*: perhaps ethical hedonism follows from a certain definition of the human being as a physiological entity (as in La Mettrie – see Chap. 4), or, more tenuously, a form of utilitarianism based on a sensationist model of the human being as responsive to complexes of pleasure and pain (Helvétius). Or it can be somehow contained *directly* within the materialist assertion itself: thus the sudden swerve of atoms is somehow already a form of ‘freedom’ for Lucretius, and the way in which our bodies are part of an immense causal network, themselves composed of smaller bodies, and impelled by a ‘striving’ (*conatus*) in Spinoza, has an emancipatory dimension, as indicated by the title of the work, *Ethics*.

Not so in the IT, where the goal is strictly to resolve or eliminate some of the problems that have arisen for philosophy as a result of the ‘mind-body problem’, by using some of the scientific successes of the previous generations—and the question of *what science* the identity theorists found their claims on will be quite important: is it neurology? Is it molecular biology (genetics)? Is it physics?—but also by applying the tools of logic: what does it mean to say that a mental event might be *the same* as a brain event? Are there two *kinds* of things which are *related* (and what would the nature of the relation be), or is there only *one thing*?

There are five further parts to this chapter: in Sect. 7.2. I discuss the Vienna Circle’s critique of vitalism, as I believe it is important, also as an influence, for understanding our Australian materialists, and because it points to specifically

⁵Boring (1933). See Place (1990), as quoted by Smart (2000/2007).

⁶Smart made some contributions to utilitarian ethical theory, but specifically stressed that there was no particular connection between his ‘metaphysics’ (the IT) and his ‘morals’.

⁷Gil (2000) attempts a political critique of the IT. For a broader claim about how McCarthyism influenced the move away from politics in analytic philosophy in the United States, see Schürmann (1994).

biological questions which the ‘logicist’ IT does not address satisfactorily in my view. In Sect. 7.3. I try to clarify the concepts of mechanistic explanation and of reduction, which are central to any materialism, but always in a new, reformulated version. In Sect. 7.4. I turn to the ‘IT’ proper, looking at its three principal theorists in turn (Place, Smart and Armstrong). In Sect. 7.5. I reflect on a set of issues which arise out of the survey of the theory, and in Sect. 7.6. I look at the main objection that was voiced, primarily in the United States, against the IT. I conclude (Sect. 7.7) with some suggestions for future recastings or emendations of a materialist theory of mind and brain.

7.2 The Early Genesis of the Theory: The Vienna Circle Critique of Vitalism

Most assertions of the ‘causal closure of the space-time world’, or the nature of a physicalist ontology as being ‘whatever the science of physics tells me at any time I will adopt as my ontology’ go back to the critiques of vitalism (read: the positing of vital forces which lie outside the physical, mechanical, causally defined realm) put forth in the early twentieth century by Vienna Circle philosophers like Moritz Schlick and Philipp Frank. Their whipping boy was the embryologist Hans Driesch.

Driesch, the father of modern vitalism as distinguished from its nineteenth and eighteenth-century variants (see Wolfe 2015), began his career as a follower of Wilhelm Roux’s *Entwicklungsmechanik*. Driesch turned away from the quest for a mechanistic explanation of development after a remarkable experimental finding. He believed his results to have demonstrated an empirical limitation to the mechanical approach, a limitation which necessitated the introduction of new forces into science. His famous experiments with sea urchin eggs involved halving the blastomere (daughter cells) of the egg and successfully producing two whole embryos and larvae, complete in every respect. This total equality of the development of the halved eggs, he called their “totipotency.” Given the notion of mechanism as he understood it, and faced with evidence that there was no mechanical structure in the sea urchin embryo responsible for the “regulative” or “equipotential” force, he felt obliged to posit a vital force, the *entelechy*.⁸ Driesch became so absorbed with this feature that he abandoned experimental work to teach philosophy at the University of Leipzig, developing the idea that *enteleches* exist in all living organisms.⁹

⁸Polanyi (1968), 1310. For Driesch, see his (1908) and (1914) monographs.

⁹The historical background to which he appealed was primarily that of the physiologist Johann Friedrich Blumenbach and his notion of a *Bildungstrieb* (formative drive) in living organisms, and secondarily that of Caspar Friedrich Wolff, who had developed an early critique of mechanistic reduction of life targeting preformationism and emphasizing the merits of the *epigenetic* account of embryonic development. Driesch’s appeal to these thinkers shows how embryology becomes the standard-bearer of vitalism within biology in the twentieth century.

Schlick, in his classic *Philosophy of Organic Life* (a shortened version of Schlick 1925) presents a virtuoso critique of Driesch's notion of entelechy based on the assumption of the causal closure of the physical (space-time) world. For Driesch the entelechy is a life-force that affects and is affected by various physical constraints in the developing organism. Schlick points out that if the physical components of the organism and its environment are required as the active constraints on this force, but this force is not accessible to us, we are obliged by the principles of parsimony to simply factor it out. Schlick, Frank and others pointed out that there cannot be non-spatial causes of organic processes which are themselves necessarily spatial. For a non-physical entity to profitably interact with a physical entity, or bring about a physical process, it must at some point itself become physical. Just as Descartes failed to reconcile psycho-physical interaction with the rigorous determinism of his mechanical universe, Driesch fails to reconcile the action of his non-physical entelechies with the determinism of Newtonian physics. A non-spatial force such as the entelechy vanishes; "if the causes are fully contained in the initial conditions, then there is no reason whatsoever for the assumption of a non-spatial intermediary."¹⁰ Such arguments were seen by the Vienna Circle as demonstrating that biological laws can and will be reduced to physical laws.

Driesch's substantival vitalism is decisively undercut by Vienna Circle arguments, not so explanatory autonomy. That is, any sort of materialist or biologically grounded account of mind can no longer invoke 'substances' or 'forces' which are independent of the physical universe. However, this need not imply that the properties we find at the biological and thus neurological level are exhaustively specified by the laws of physics. This is why philosophers of biology have spoken so much about "explanations" in recent years. What is a biological explanation? Is it one which reduces a phenomenon to its molecular components? If so, we are left with physics and some chemistry. What happened to biology?

7.3 The Power of Reduction

Philosophical debates concerning the status of explanation in the biological sciences have focused on subsumption, on the possibility of subsuming (or reducing) the propositions of biology to those of physico-chemistry. Reductionists have traditionally argued that the laws and predictions of non-physical sciences like biology can be derived, or inferred from the laws of physics supplemented with appropriate definitional or empirical bridge laws (which allow for fully shared definitions between the sciences: a higher-level phenomenon can be explained by a lower-level science by means of laws which enable the 'gap' between the two sciences to be 'bridged'). While the reductionist awaits the appropriate bridge laws, s/he may continue to make use of specialized terms like 'organism' or 'gene' on a provisional

¹⁰Schlick (1953), 536. Armstrong in the 1970s reprised such points, arguing that the problem with intentionality or secondary qualities for the materialist was: do they bestow any causal power?

basis, with the understanding that these serve only as an instrumental convenience, and that they are vestiges of an already superseded ontology. Molecular biology tends to be accepted as ‘ontologically real’; anything higher-level is often explained as *instrumental*: as the product of human concerns.¹¹ As Smart says, a tree is certainly not something which is structurally individuated; if we were much smaller, a dandelion might count as a tree (Smart 2000).

Faith in the power of reductive explanations was significantly reinforced by Watson and Crick’s discovery of DNA in the early 1950s (Place’s ‘foundational’ article appeared in 1956, Feigl’s in 1958, and Smart’s in 1959). Molecular biology seemed to answer the worries of theoretical biologists and philosophers who doubted the possibility of mechanical explanations in developmental biology. The initial optimism of the reductionists has been tempered considerably, and by now, philosophers of biology have, for the most part, agreed that a reduction of biology to physics and chemistry is implausible. That is to say, even if biology does not exhibit the law-structure of physics and chemistry, its ‘unpredictable’ character, full of emergent properties and non-mechanical causation is nonetheless part of the ‘furniture’ of the world (the dynamic relation between an environment and an organism or ‘system’ is unlike any that exists in an idealized mechanical world, with its exceptionless linear chains of causal influence). It will not disappear, nor be “reduced” out of existence. As the example of evolution has shown over the years (to Karl Popper and Ernst Mayr most famously), biology does have its laws, but they do not have the predictive powers that laws of nature are ‘supposed’ to have on the ordinary, linear-causal view.

Given physicalist ontological assumptions and the instrumental power of biology, philosophy of mind (like philosophy of biology) looked as if it were going to be functionalist for quite some time. Functionalists regard mental life as a set of functions or patterns that are *contingently* implemented in human brains (Bickle et al. 2012). Curiously, as I’ll discuss below, this contingency was itself an important part of the IT. Mental states just happen to be implemented by biological systems but they could just as easily be implemented in a suitably organized computer, cloud of gas, or anthill. Computational functionalism is a familiar and comfortable position for philosophers, but I think that it has become increasingly clear that computational functionalism is either incorrect, or that it says so little as to be irrelevant to those of us who are interested in understanding mental life—including from a materialist point of view! (I shall return to functionalism as an ‘anti-metaphysical’ critique of IT in Sect. 7.7).

To be clear, the materialist theory of mind presented here does not view terms such as ‘mechanistic’ or ‘reductionistic’ with shame. It is rather words such as ‘holism’ or ‘emergence’ which it regards with suspicion. Unfortunately, some philosophers, especially on the Continent, tend to respond to this with a similarly provincial attitude, reacting to the danger of *reductionism*. As always, a homeopathic dose of history may help calm the tension. The basic program of the original mechanical philosophy of the seventeenth century rested on the notion that natural

¹¹Alex Rosenberg is representative of this ‘instrumentalist’ view (see e.g. Rosenberg 1989).

phenomena are the result of interactions between material particles governed by those laws treated in the science of mechanics. This led to the development of general laws of motion and impact, and secondly, to the invention of particular mechanisms or machine-like arrangements of material parts to explain particular phenomena. We shouldn't assert too quickly that that the mind in particular and perhaps biology in general has nothing to do with such 'analytic' explanations ('analytic' being used in the literal sense of 'decomposition', *analyein*: to explain a phenomenon by reference to its components) – and, as I discussed in the early modern context in earlier chapters, but will also examine in a contemporary context (phantom limbs) in Chap. 8, the reductionist aspect of an embodied materialism may not be what anti-reductionists think their familiar target is.

7.4 The Identity Theory: Place, Smart and Armstrong

Hopefully the previous remarks on mechanism, reductionism and the seemingly distant example of the Vienna Circle should prepare the ground for an examination of the IT, the paradigmatic expression of materialism in twentieth-century Anglophone philosophy, the ideas of which continue to exist in neuroscientifically augmented form, e.g. in the 'neurophilosophy' the Churchlands (*passim*) and John Bickle (Bickle 1998, 2003). What was the relation, then, to early positivism? I think that the philosophical reaffirmation of mechanism and critique of vitalism was essential in constructing a philosophy of biology, and by extension a philosophy of mind, that does not appeal to apparently extra-physical forces. To this it added a certain dose of behaviorism, in an attempt to counter the then-dominant trend, ordinary-language philosophy, with its denial of any substantial or 'material' questions in philosophy. It is precisely this arrogance of philosophy of language that is captured in anecdotes such as the one Armstrong recounts about "a touch of the sun, I suppose." The mechanistic ancestry was important as it brought a concern with science understood as a body of laws, and a desire to include mental processes *in* this body of laws (cf. the 'true beginning' of Smart's article as discussed below, when he confesses to his disbelief that *everything* could be explained by scientific means, except human sensation). The behaviorist element was important as an attempt to 'spatialize' or 'physicalize' the mental. Notice that none of this makes the IT 'foreign' or 'hostile' to metaphysics. On the contrary, it *is a metaphysics of mind*.¹²

The IT is defended as a philosophy of mind and thus a 'solution' to the mind-body problem, because it satisfies five basic criteria, as enumerated by Armstrong: (i) it accounts for the unity of mind and body; (ii) it can explain the numerical difference between minds (individuation); (iii) it can explain the interaction of mind and body; (iv) it can give an account, e.g. an evolutionary account, of the emergence

¹²As I note below when discussing Smart, the combination of DNA, physics and behaviorism can also be used to 'save' philosophy in general from Wittgensteinian scepticism.

of mind; (v) it can give an account of inner states.¹³ I shall now turn to the three individuals responsible for the formulation of the theory, before reflecting on the theory as a whole.

With Place's founding article, we can see right away how far we have come from the eighteenth century: modern physicalism, unlike the materialism of the seventeenth and eighteenth centuries, is *behavioristic* (Place 1956, 78). What the truth of behaviorism entails for Place is that consciousness can now be understood as a type of behavior, or a *disposition* to behavior. Thereby the mysterious realm of the mental can be 'spatialized' and the danger of philosophical dualism can be dispelled. Disposition talk is a way of avoiding the issue of intentions. Yet the argument against dualism—the claim that consciousness is a process in the brain—is not a *logical argument*. For Place, the relata in the IT (consciousness and brain process, in his terms) are not linked by a relation of logical necessity. The claim is rather a scientific hypothesis, for him; it will not be so for Smart. To say that 'consciousness is a brain process' is like saying 'humans are mammals': two terms are not coextensive with one another. Not all mammals are humans, not all brain processes are conscious. Unlike a claim such as 'Red is a color', 'Consciousness is a brain process' is logically contingent.

Place speaks of the "phenomenological fallacy" (82f.), of thinking that when a subject reports on his or her states, s/he is actually describing the literal properties of the objects affecting them, through introspection. This is why the IT-ists are always asking: *what exactly is happening* when I say 'I see a green patch'? We believe that we come to know the real properties of objects through their phenomenal properties, while in fact the reverse is true. Place attacks this fallacy and links it to what psychologists call the 'phenomenal field'; we might surmise that the attack holds good, intentionally or not, against phenomenology as a whole—the idea of the world as field of experiences which are *mine*, thus the field is *my* field, and not some impersonal physical totality of the world.

There is a contingent identity between sensations and brain processes. But what about the 'experience' objection? Isn't there a difference between my experience of the morning star and my experience of the evening star, which allows me to individuate them, whereas the brain process (and the star itself) are indistinguishable?¹⁴ One way of approaching the problem, as Feigl did, was to use the old Fregean distinction: the *referent* (*Bedeutung*) of neurophysiological descriptions (or 'brain process' statements) is the same as that of phenomenal descriptions ('mental process' statements); but not their *meaning* (*Sinn*).¹⁵ As we will see, Smart does not make use of this solution.

After some initial acknowledgments, Smart's 1959 article begins quite abruptly: "Suppose that I report that I have at this moment a roundish, blurry-edged after-

¹³Armstrong (1968/1993), 75–76.

¹⁴If this were true, we would have an *irreducibly mental property*. We could be 'substance materialists', or rather 'substance monists' who held that there is only one kind of substance in the world, matter and its diverse modifications; but we would be property dualists.

¹⁵Feigl, "Mind-Body *not* a Pseudo-Problem" [1960], in Feigl (1981), 344, 347.

image which is yellowish towards its edge and orange towards its center. What is it that I am reporting?"¹⁶ It turns out that he is beginning where Place left off 3 years before,¹⁷ with the question: what is an after-image? (Notice that Smart does not build on a tradition of philosophical materialism, but instead seeks to draw a conclusion from the science of his day ... much as other materialists did – again showing the impossibility of a linear and/or cumulative ‘tradition’ or ‘history’ of materialism¹⁸).

Compared to the abrupt beginning, a more rhetorically satisfying beginning to Smart’s article can be found several paragraphs later: “*That everything should be explicable in terms of physics* (together of course with descriptions of the ways in which the parts are put together—roughly, biology is to physics as radio-engineering is to electro-magnetism) *except the occurrence of sensations seems to me to be frankly unbelievable*” (Smart 1959, 142, emphasis mine). In other words, if recent scientific developments show that organisms can be understood as physico-chemical mechanisms, what does this imply for the mind?¹⁹ But the first implication Smart wishes to emphasize concerns the *language* we use to describe mental events, such as ‘I am in pain’ or ‘I see pink lights in the Shanghai sky’. They cannot be taken as legitimate “reports” of an *irreducibly psychic realm*. Here Smart invokes Occam’s razor: the physico-chemical explanation is the simplest. Place argued for the position as a probable empirical truth; Smart argues for it on strictly logical grounds. Armstrong asks: is dualism a plausible theory in light of modern scientific knowledge, especially concerning the workings of the brain (Armstrong 1968/1993, 29)? The burden of proof on dualism concerns the coming-into-being of the mental: how something non-physical emerge from something purely physical (47f.)? This is a purely *empirical* problem, not a logical one: it is perfectly logical to imagine non-physical causes of physical events (31).

Yet somehow, sensations or states of consciousness have been left outside of this scheme of explanation. Some thinkers will allow for the two to be related as *correlates*, but this seems odd to Smart, since correlates have to be two distinct things. Sensations and brain processes are not! In his famous example, it is like correlating “Bill Sikes the burglar with Bill Sikes the burglar,” instead of the more sensible kind of correlation, e.g. “footprints with burglars” (Smart 1959, 142). Thus Smart wishes to show “that there are no philosophical arguments which compel us to be dualists.”²⁰ *There are no sensations*; there are human beings, which are “vast arrangements of

¹⁶ Smart (1959), 141.

¹⁷ In fact, Place himself explains that his own 1956 paper was the result of “a series of informal discussions” at the University of Adelaide “between Charlie Martin, Jack Smart and myself” (Place 1997); these articles are full of comments such as “I owe this point to Place, who made it in a conversation,” or “Armstrong first made this objection to me but has since informed me that he has abandoned it”: it is a very tightly knit community of discourse.

¹⁸ See my discussion in Chap. 1.

¹⁹ Smart (1959), 142.

²⁰ *Ibid.*, 143.

physical particles,” but there are not, “over and above this, sensations or states of consciousness. There are just behavioral facts about this vast mechanism.”

These behavioral facts include *dispositions* to report physical “object statements.” The idea of behavioral dispositions is one of the alternate views which Smart finds acceptable, but which is distinct from his ‘sensations are brain processes’ claim. To borrow a colourful example from John Symons, the mentalistic statement ‘The organism wants to eat cheese’ can be transformed for the behaviorist into ‘If in the presence of cheese, the organism will eat it’.²¹ But what if the organism has a problem that day and simply does not want to eat the cheese, or cannot? There is an entire intentional realm which is missing from this reduction. Partly due to this, as it forces the theorist to commit to additional, unlikely claims, Smart abandoned the behavioral talk.

More generally, as Armstrong saw, the most obvious problem with behaviorism for a materialist, despite its initial charm for the identity theorists as a way of escaping from Wittgensteinian skepticism and thereby giving some physical tangibility to the mental, ridding it of its mysterious properties, is if that you are genuinely interested in the mind and its mechanisms, behaviorism will not tell you much! Of course, there is no logical impossibility involved in being a sort of behaviorist and *also* believing that the behavior studied empirically reduces to neural mechanisms. Thus Smart, in his *Britannica* entry “Materialism” (Smart 1974/2000) explains that central-state materialists (a term that for a while was used as a synonym for ‘identity theorists’ but fell into disuse) are partly motivated by their dissatisfaction with Ryle’s ‘analytical behaviorism’, and refers to Medlin’s “materialist critique of Ryle” (Medlin 1971). A ‘central-state materialist’ is essentially what we would recognize as an identity theorist: it is someone who believes that mental processes are identical with processes in the brain (the ‘central’ nervous system); Armstrong asserts that “Before the modern revival, the most conspicuous defender of a Central-state theory was Thomas Hobbes” (Armstrong 1968/1993, 11).

At the peak of discussions of the IT, in the 1970s, shortly before the combined assaults of functionalism and ‘supervenience’ theories, it was common to distinguish between *two types* of central-state materialism: (i) the ‘translation’ thesis, according to which mental discourse can be *translated* into a more physicalistic discourse; it is for example represented by Feigl; (ii) the ‘disappearance’ thesis, according to which our ordinary mentalistic language (our “folk psychology”) is entirely false and cannot be translated into anything true at all! In the 1970s, Feyerabend argued that mentalistic language such as ‘I feel’, ‘I think’ or ‘I believe’ is no different—no better—than medieval discourse about epileptics as being “possessed by the devil” (Feyerabend 1963 296). Such language exists, but is doomed to *disappear* when science absorbs it into its own body of true statements. Armstrong, for one, argues against such a thesis as he feels that mental states genuinely exist.²²

²¹ Symons (2002), 19.

²² The specter of analytical or logical behaviorism within contemporary materialism recurs in debates between, e.g. the Churchlands and Dennett (with the former accusing the latter of being

To return to Smart's thesis: like Place (and perhaps also Feigl, to whom he refers here²³), Smart is not stating that sensation statements can be *translated* into statements about brain processes, nor that the logic of the first kind of statement is the same as the logic of the second kind of statement. Rather, Smart's thesis is that insofar as a sensation statement is a report of something, that something is in fact a brain process. "Sensations are nothing over and above brain processes. Nations are nothing 'over and above' citizens, but this does not prevent the logic of nation statements being very different from the logic of citizen statements" (Smart 1959, 145), and the same for translatability. The *logic* of the two kinds of statements—sensation statements and brain-process statements, nation statements and citizen statements—can be different without the *entities* differing. Faced with the objection that it makes sense to describe molecular motion in the brain as circular, or fast, or slow, but it makes no sense to describe my experience of seeing green as circular, fast, or slow, Smart replies that it is the *logic* of the two processes that is different. Seeing somebody in the room and seeing the doctor does not amount to seeing two different people; however, the 'logic' of 'somebody' and that of 'doctor' are different. But the sensation or experience and the brain-process *might well refer to the same thing*²⁴ – hence all the talk of 'contingent identity': Smart's purpose, along with Place, is to ensure that such identity is not disqualified out of hand.

Perhaps we are in a better position now to understand why the article begins so abruptly, i.e., what it means to inquire into what is happening when I see a patch of yellow or a field of grass, and I describe the experience. The task of the IT is to give an account in non-mentalistic terms of what we report when we report a sensation of yellow or green—or to show how such an account is possible. When we report on a mental state like an after-image, we are saying something like: "There is something going on within me that is like what happens when a certain physical stimulus is present." The curious thing is that Smart has not actually said *which* physical event the mental event is like. That is why the IT is topic-neutral. However, he has left 'room' for science to 'fill in the gaps'.

What *sort of claim* is the IT, then? When the identity theorist says that sensations are identical to brain processes, in which box do we file her claim? Smart refers to Place, for whom it was a genuine *scientific theory* (Smart 1959, 155). To Smart, this is partly right and partly wrong. It is right inasmuch as the claim that sensations are brain processes can be tested scientifically, in comparison with analogous claims such as 'Sensations occur in the kidneys' (as if Vogt had made a more earnest claim, e.g. 'The brain secretes thought *in precisely the same way, according to the same glandular mechanisms*, as the kidneys secrete bile'). We have had good anatomical and physiological reasons at least since the early eighteenth century to locate mental activity in the brain; now we have machines which enable us to *see* areas in the brain

'just' a behaviorist rather than a true materialist). In his book, Armstrong suggests (confusingly) that behaviorism and 'central-state' materialism are two species of materialism ... (Armstrong 1968/1993, 54).

²³ Feigl (1958), 390.

²⁴ Smart (1959), 151.

light up (not to mention more recent cortical microstimulation experiments, as I discuss below), so we *know* something is happening there. For Place, the IT as a contingent claim about the identity of the mental and the physical moves closer to the status of a verifiable or falsifiable scientific theory, as “brain-imaging evidence begins to replace the subject’s introspective report in determining the occurrence and nature of her conscious experience.”²⁵

Place is wrong, however, in claiming that the choice between a materialist position and an epiphenomenalist one can be settled empirically. We had already seen that Place grounded the IT empirically whereas Smart grounded it on the principle of parsimony (Occam’s razor). No evidence can be brought to bear against me if I believe that my mind is irreducible to anything in physical reality, while yet existing nonetheless; in other words, that the world is made of material processes, exhaustively, yet there are mental ‘things’ which exist somehow ‘on top’ of this physical reality, while being nevertheless fully dependent on material processes and without causal efficacy of their own. It was T.H. Huxley who first spoke of such views as ‘epiphenomenal’: an epiphenomenon is an event which is itself caused but which does not have the power to cause any other event. Smart describes it by means of the following image: mental processes are related to material things somewhat in the way that a man’s shadow is related to the man. On the contrary, for Smart there is an identity between mental processes and brain processes, but unlike Place (or Feigl, for whom a “detailed account of brain-mind identities is a matter of future progress of psychophysiological research”²⁶), he does not think this should lead to empirically testable hypotheses, although the ‘truth’ of the identity is most probable. Thus he ends his article with a falsely modest Anglo-Saxon flourish: there is no hard evidence for his materialist theory, but dualists have to add “a large number of ... psychophysical laws ... of a queer sort” (156).

Note that Smart is not proposing to launch a new, insanely inflated psychophysics, with a new body of laws governing each sensation, now suddenly specifiable in neurophysiological terms. This is where he parts ways with the architectonic frenzy of the Vienna Circle, with its love for ‘Chinese puzzles’ of interlocking laws, each fitting neatly into the next. Not ontology, but logic; and only a contingent logic at that. No deductive schema.(e.g. no Viennese-style deductive reduction of neurophysiology to physics²⁷). To determine which brain processes are sensations, it is sufficient to determine which ones play a causal role in behavior (specifically, in types of behavior which include “sensation reports”).²⁸ Smart is quite aware of the difficulty of correlating complex, intentional mental states with patterns of neuronal activity: “conscious experiences must be processes involving millions of neurons,

²⁵ Place (1997), 15.

²⁶ Feigl (1967), 90.

²⁷ Smart (1981), in (1987), 247.

²⁸ Smart (1961), 407.

and so their important likenesses and unlikenesses to one another may well be statistical in nature.”²⁹

7.5 Reflections on the IT

7.5.1 *With What Does the IT Begin?*

It is important—and frustrating—for the materialist to note that in the IT there is a strictly *contingent* relation between Mind and Brain (Polger 2011, 13). Further, there is no *logical* connection between a materialist, reductionist theory of mind and its ‘basis’, that is, the choice of empirical evidence on which to found such a reduction. If I claim that the world as we experience it is explainable in terms of some more fundamental material level, it is *up to me* (“contingent”) if I want to base this claim on atoms and other kinds of micro-physical entities, anatomical and physiological advances concerning the human body, neurology, and so on. This is essentially the way Feigl construes the IT, as a matter of empirical investigation of the correspondence between the mental and the physical rather than any *logical* equivalence. Specifically, the isomorphism between phenomenal patterns and neural patterns is empirically establishable (or refutable) and thereby logically contingent.³⁰ One could also speak of a priori versus a posteriori identities (as Polger 2011 suggests).

Similarly, we might ask: what and where is the science in the IT? There are hints of DNA and neurology; but mostly, there is physics. This is why so often people like Smart fear that “materialism” is too vague, and belongs also to theories he rejects, and they need to add “my theory is a *physicalist* materialism.” Physicalism restricts meaningful statements to physical bodies or processes that are verifiable or in principle verifiable. It is an empirical hypothesis that is subject to revision and, hence, it is claimed, lacks the dogmatic stance of classical materialism. Personally, I have never seen a physicalist revise his or her ontology! The idea is that *if* a completely new physics were unveiled—not to mention ‘if new mental properties were discovered which could be shown not to obey known causal laws’—the physicalist would have to change ontologies. But such proclamations of flexibility, as compared to the ‘dogmatic’ position characteristic of metaphysically grounded positions, usually remain just that: mere proclamations.³¹

²⁹Smart (1963), 656. Smart’s version of the IT is thus more flexible than Place’s. No empirical claims about *translating* sensation statements into brain-process statements need be made (Smart 1959, 144). Just because “there must be no predicates that are not definable in a physicalist language” (Smart 1987, 225) does not mean one has to be committed to translatability (*ibid.*, 216ff., 243–244).

³⁰“No Pot of Message” (1974), in Feigl (1981), 16.

³¹What Norwood Hanson called the ‘dematerialization’ of matter, raises questions concerning what ‘materialism’ means in terms of the theories of microphysics.

There are various attempts to formulate a brand of “physicalism” which would allow for different levels, thus belying the old slur from Auguste Comte that ‘materialism seeks to explain the higher by means of the lower’ (Comte 1844/1974, § 77). A view which gained popularity in the philosophy of mind, since it is so obviously close to materialism, unlike emergentism, which is uncomfortably “metaphysical” or “idealistic” for some philosophers (including Smart³²), is supervenience: the mental rests on the physical, necessarily, and without any causal ‘supplement’; but it is not *reducible* to the physical; thus it “supervenies” on the physical. If A is supervenient on B, then for any x which has the same properties as B, x will have the same properties as A. Thus any two physical objects with the same physical properties will have the same psychological (mental) properties.

It is also possible to have a fully physicalistic ontology without accepting the specifics of the IT at all, as was the case with Wilfrid Sellars. Sellars’ distinction between the “manifest image” and the “scientific image” is also an attempt to deal with the same two *relata* as in the IT. The difference is that Sellars is not a materialist, or indeed any kind of reductionist, but rather a Kantian. For Sellars, our picture of the world relies ineradicably on mentalistic concepts—the “manifest image.” This image does indeed *not* provide us with the ‘truth’ about the world, metaphysically speaking. Rather, this truth is provided by the “scientific image,” specifically, by modern physical science. Physics specifies what is ontologically real, but human life will never be ‘reduced’ in any way to the concepts of physics.³³

Alternately, instead of treating the flexibility of physicalism as merely stipulative, it can also be taken as a reminder of our epistemological modesty: if classical and modern materialism relied on a strong notion of Nature and especially natural laws, natural causality, and natural determinism, what happens to ‘late modern materialism’, if it is re-‘grounded’ on a non-deterministic physics, an emerging notion of ‘multiple’ or ‘circular’ causality, and a philosophy of science which increasingly questions the very notion of a ‘law of nature’? To put it differently, and more bluntly: what if it turned out that materialism was ‘committed’ to a certain picture of physics, which is no longer in use in the science of physics? (Some thinkers, including Althusser but also the biologist Jean-Jacques Kupiec with his appeals to a metaphysics of chance, would reply that it is time to return to Lucretianism, with its combination of indeterminism, ethics, and ceaseless process of ‘secularization’; see Wolfe 2012) The same holds for the *brain* itself: it may well be that neuroanatomical and neurophysiological research will *show* that the brain is in no way a causal mechanism (put tautologically, an entity defined by mechanical causality) in the way that a ‘materialist theory’ holds.

One could ask, how does the identity theorist get from a claim about physics or even DNA to a brain-mind claim? Is the ‘physics is our best metaphysics’ claim simply transposed to the relation between neurology and psychology? In the case of the IT, one gets there by analogy; Armstrong says it is a “good bet” (Armstrong 1968/1993, 90); in fact a combination of blind faith in the power of reduction and

³²For Smart’s argument see Smart (1981), reprinted in Smart (1987).

³³See Sellars, “Philosophy and the Scientific Image of Man” in Sellars (1963).

an inductive argument based on the past successes of the reductive approach. All underwritten by a general sense that nature is economical (as evidenced in Smart's occasional invocations of Occam's razor).

7.5.2 *The IT as a Logical Theory*

Is the IT really a materialist theory, or is it merely a logical theory? Does it matter? If the identity theorists are adamant about how their theory is logically contingent, how does this compare with earlier materialist theories? Can we find examples of materialist theories which *do* claim to be logically necessary? Most of the time the argument is based on a kind of empirical evidence that comes from inquiry into nature. Of course this in itself does not force all materialisms to be physicalistic in the sense of awaiting falsification from physics. Both the more biologically oriented variants and the more metaphysical ones will demand a degree of autonomy from physics — explanatory autonomy, of course, but sometimes even ontological.

The *logically contingent* nature of the IT is important for two reasons. First, because if the theory, as a philosophical theory, is ever to allow itself to be confirmed or otherwise modified by scientific evidence—if, in other words, it is to be anything like an empirical hypothesis—then it *must* be contingent. Second, because if the claim was that the identity between brain process and mental process was logically *necessary*, it would render the IT infinitely more vulnerable to refutation. A large part of the task of Place and Smart (less so Armstrong) is to defend a logically contingent claim against charges of logical necessity which in turn lead to falsity. For example, if experience or mental processes of various kinds have properties which are not possessed by brain processes, then a logically necessary identity must be false. This is what was meant by saying that 'Sensations are brain processes' is like 'Humans are mammals' or, in the example shared by Place, Smart and Feigl, 'Lightning is an electrical discharge', but not like 'Red is a color': in the first three cases, 'A=B' is a contingent identity statement.

7.6 A Challenge to any Materialism: Functionalism

The use of neuroscientific evidence in Place (1956) and Smart (1959) was understood to provide a placeholder for future scientific discoveries. As Bickle, Mandik and Landreth note (2012), there were a number of plausible candidates for psycho-neural identities hypothesized in the scientific literature long before the identity theorists published their landmark articles in the late Fifties. For example, in Donald Hebb's *The Organization of Behavior* (1949), we find detailed explanations of psychological phenomena in terms of known neural mechanisms and processes. Bickle and Mandik correctly point to the absence of much neuroscientific evidence in the arguments of the identity theorists. I can only mention this issue without developing

it further, but precisely for this reason a materialist who wishes to evaluate the IT will likely ask, ‘where is the biology?’ In more broadly metaphysical terms, a *comparative* remark can be made: in almost any other philosophical materialism, claims are made which *do seek to base themselves* on a kind of *evidence*, although this does not prevent them from also being speculative (the case of Diderot comes to mind). Indeed, it may be a restrictive view of materialism to see it as necessarily grounded in scientific evidence (as I discuss further in the Conclusion to this book).

But if the goal is to describe the stages in the reception of the theory, one must immediately turn to the main point on which it was criticized, which for a time changed the face of the philosophy of mind, although only for a time: *functionalism*.

The IT was widely criticized in the 1960s and 1970s for its failure to account for the multiple realizability of mental phenomena. The ensuing functionalist tradition was born out of this critique and rests on the notion of multiple realizability. Something is multiply realizable if it can be supported by a variety of different mechanisms. For example we would say that pain is multiply realizable if we agreed that cuttlefish, who have no C-fibres can feel pain. If we agree that pain can occur in animals that do not have C-fibres then it is false to assert that the concept pain and the concept C-fibre really refer to the same thing. This criticism of the IT provided a point of general agreement in the philosophy of mind from the late 1960s until very recently.

According to the functionalist position, mental states are defined by their functional or causal role: what they are “for,” like a part in a machine. The supposed improvement of functionalism over materialism, including the IT, is in fact a return to the mechanistic models of the seventeenth and eighteenth centuries, when models such as clocks were used to explain the human body, precisely *not* in a reductionist way. In the absence of a straightforward identity of mental and physical states, the digital computer seemed to provide a way to explain how mental life could be embodied.³⁴ Thus one could speak of “computational functionalism.” One of the great strengths of functionalism is that it is not a particularly restrictive view, it simply asserts that most psychological phenomena are what they are by virtue of their place within a causal structure. To have a belief X is to have a disposition which *causes* me to do X. Mental states are what they are, by virtue of playing certain causal roles in the world. For a functionalist, as Dennett puts it, ‘handsome is as handsome does’. A mental state is whatever causes us to exhibit a certain behavior. But at this point something has been lost; the explanation has become strangely

³⁴ If one asks, what is the relation between the IT and AI (the artificial intelligence research programme, which is roughly contemporaneous with the IT) I would suggest a fairly limited affinity. To the extent that the IT seeks to ‘demystify’ and allow, perhaps for the future ‘quantification’ of sensory and perceptual processes, thereby locating them squarely in a causal network, it can be taken as ‘consonant’ with AI. Armstrong, who does seem more sympathetic to functionalism than the others, does say that “a materialist will see no difficulty in the *notion* of artificial intelligence,” since internal states have no privileged status (Armstrong, in Armstrong and Malcolm 1984, 160–161).

weak. We are no longer trying to *explain* anything about the nature of mental states and how they relate to a material process.

Earlier on I briefly alluded to the genuine ‘power’ of mechanical explanations, of reduction. Many worthy philosophers continue to believe that some important portion of the universe can be explained by taking an object (or phenomenon) and explaining it *by virtue of its intrinsic, or non-relational properties*. As Smart puts it, unwittingly showing the vitality of a tradition that goes back to the atomists: “A physicalistic Materialist has, of course, an obligation to go on to give a suitable account of such apparently nonphysicalist qualities as the greenness of grass” (“Materialism,” n.p.)—only Armstrong, to my knowledge, says things like “a materialist is forced to attempt an *analysis* of intentionality” (Armstrong 1968/1993, 57).

Of course, to say ‘you are what you do’—as a more recognizable metaphysical version of Dennett’s ‘handsome is as handsome does’—has been a very popular position in many philosophical traditions. Functionalism proper, under various guises, dominated the philosophy of mind for several decades. But perhaps this orthodoxy is an indication of just how little functionalism, in its most minimal and universally accepted form, really says about the mind. Simply, it cannot satisfy the metaphysical appetite of the materialist. If the word ‘metaphysics’ sounds disturbing, the objection can also be formulated in another way: such a ‘weak’ explanation fails to tell us much about the way science works. Functionalism is too likeable for its own good. We need a dose of reduction!³⁵

If robots can beat Gary Kasparov at chess, and much more now,³⁶ then thinking (consciousness, and sensation in a non-qualia-oriented sense) can be “realized” on a silicon basis as much as on a carbon basis. This is how functionalism and its mantra of “multiple realizability” seemed to overpower the IT in the 1970s, with figures such as Hilary Putnam and Jerry Fodor. If we are to remain any sort of materialists, and if we believe that what neuroscience does has implications for our understanding of mental life, it is not possible to accept statements such as Putnam’s “We could be made out of Swiss cheese and it wouldn’t matter.”³⁷ This might seem like a relatively easy target for criticism. In our time, it almost goes without saying that we need to understand the brain in order to understand how we think, feel, perceive and remember the world. Moreover, since people with damaged brains often have impaired mental function the connection between brain and mind seems self-evident. On an everyday level, strokes, head injuries, narcotics etc., testify to the significance of the nervous system for our mental lives. Similarly, in scientific practice limits on the number of neurons, on the numbers of connections between neurons and the time course of neural activity, and so on, constrain models of perception, memory, learning, and sensorimotor control. The undeniable interplay between mental and biological life should not, however, force us to deny that mental life might constitute an autonomous level of explanation.

³⁵ See Richardson (1979) for an early attempt to reintroduce reductionism.

³⁶ See Smart (1963), VI, § 3, “Problem-solving ingenuity,” and Armstrong (1968/1993), 357 on the implications of ‘intelligent machines’ for the IT.

³⁷ “Philosophy and our mental life,” in Putnam (1975), 291.

This can be allowed for in a picture of the relation between brain and mind, but also the brain and the social world, which has more *levels*. For example, the real locus of problem-solving, of ‘ideation’, is not a mysterious representational center in the brain, but rather the interaction of the organism with its natural and social surroundings, inside the brain. Symbolic activity is a constitutive feature of human minds. I am not the first to respond to materialism in the philosophy of mind with the Spinozist point that that ‘the order and connection of ideas are the same as the order and connection of ideas’, which is a point about structural and relational identities rather than ‘one brain fibre:one idea’ correspondence. The individual, including in the most ‘biologistic’ of definitions, cannot exist or be understood outside of a linguistic/social matrix, and thus the brain is not independent of this ‘matrix’ either. As Alexandre Métraux has discussed (Métraux 1992), also with reference to the work of Luria, there may even be evidence of consequences in the functional organization of the human brain derived from early social interaction: past experience is embodied in synaptic modifications. *Exeunt* the classic Engelsian claims that in naïve naturalistic materialism there can be no room for the intersubjective, ‘social construction’ of the human world. A materialism which takes the brain seriously will shift the ground of discussion away from the IT as a merely logical claim, towards neuroanatomical, evolutionary, and psychological evidence—‘bringing the biology back in’, and at the same time the social world.

7.7 Conclusion

The IT was a common solution to the mind-body problem in the 1950s and 1960s. Identity theorists held that psychological and physical terms both referred to the same thing. They claimed, in their more empiricist moments, that someday neuroscience would allow us to understand how neurophysiological structures and processes were identical with what we think of as mental life. The idea was that we could, to take the classic example, some day prove that pain *is* the firing of C-fibres.³⁸ According to Place and Smart, mental states and brain states are contingently identical. It then follows that for each theoretical statement that appears in psychology, (P), there must be a true statement that articulates a psychophysical identity between (P) and a neural state or process (N): a statement of the form $P=N$. Where ‘N’ is a neural state, ‘P’ is a theoretical statement of psychology and ‘ $P=N$ ’ is a psychophysical identity statement. Some philosophers accepted physicalism but wished to deny that there were any genuine psycho-physical identities, or rather *laws*. There may be token identity, but not type identity (some mental states might be physical, not all).

³⁸The C-fibres example was a prominent feature in arguments for and against the identity theory. It seems to have been introduced in Putnam’s early article “Minds and Machines” (in Putnam 1975), in reference to an exchange between Herbert Feigl and Max Black (Kaitaro 2004). It turns out, however, that the C-fibres are related only to a very specific aspect of pain transmission (Hardcastle 1997).

In a biologically based materialism as described in earlier chapters in this book, and perhaps again now with ‘embodied cognitive science’, there is no need to correlate mental states and physical states; nor is there an insistence on a functional explanation of mental states which avoids any inquiry into the material basis of their realization (they are “multiply” realizable). Rather, the ‘mental’ becomes a function of the biological organism as a whole, also with reference to the environment, as sketched out briefly above. The embodied materialist should take it as her task to do justice to the biology (contra functionalism); as Alexandre Métraux put it:

The task [of philosophy] is to describe the epistemological space of a theory of the mental as humid, somnolent, unconscious, dreaming, neurotic, calculating, representing, reasoning and sometimes panicking – not a theory of ‘abstract functional consciousness’ as a full or partial property of bodies possessing neurons or chips, nerves or semiconductors. Curiously, no one has, as far as I know, studied digestion or sleep as a set of functions that are embodied, now in a man, now in a robot duck. Abstract, non-corporeal, strictly functional digestion is biologically empty, just like ... the mental [understood as] abstract, non-corporeal, strictly functional, disembodied and anemic (Métraux 1999, 68).

As Kaitaro has analyzed with reference to the history of brain-mind ‘dualisms’ in neurological research, to look for the neural or anatomical correlates of mental functions or mental items, such as ideas, memories, thoughts etc., usually means to perform two separate analyses, and then correlate the results of these analyzes: on the one hand, an analysis of the mind into separate faculties or into a collection of separate items, e.g. ideas or impressions, and on the other hand, an analysis of the brain into separate parts. Then one has made the (often groundless) supposition that these analyses must correspond: the elements of the mental correspond with the anatomical or physiological elements. A series of identities is thus articulated between the mental and the physiological, but

of course the metaphysical interpretation of these identities depends on whether one is a materialist or a dualist, but on the basis of the historical analysis of localizationist doctrines it seems that the postulation of such identities in itself is not committed to dualism or materialism (Kaitaro 2004, 629).

In Kaitaro’s view—but this takes us into historical territory which is not part of the province of this chapter—the identification of representations with anatomical entities is in fact more compatible with dualism than materialism, including the most famous example of mind-body dualism, Descartes, whose theory is precisely a *localization* of the interaction of the mental and the physical, with the pineal gland. As Polger has also noted (Polger 2011, 9), the IT seems committed to the strongest possible identity claim...In fact, as we saw the IT oscillates in between being a strictly logical theory and an empirical, contingent theory. Curiously, it is the latter which allows of the most flexibility: for just as much as it was proclaimed as a kind of scientism by Place, and indeed can become a set of wholly empirical claims in which our knowledge of mental life is filled in by the progress of our knowledge of – by now – *cellular* neuroscience (Bickle), it can also be extended in the form of a more open-ended ‘heuristic identity theory’ (McCauley and Bechtel 2001), that searches for identities as tools in scientific discovery.

Whither the IT? I’ve said several times including in the Introduction that the issue here is not necessarily to defend the absolute ‘truth’ of materialism. But it is

then quite understandable to wonder, what relevance the IT might have for us 56 years later. To this, my provisional answer is the following. With some reservations, developments in experimental neuroscience seem to substantiate the position that one can concretely identify a lived (experienced, felt) mental event, as something qualitative, with a (physical) cerebral event, accessible to scientific manipulation. Ever since the early eighteenth century we have had good anatomical and physiological reasons to locate mental activity in the brain (whether or not, *pace* Du Bois-Reymond, it is a good idea to categorically identify thought and brain activity); for the past thirty-odd years we have technological means to see cerebral areas be illuminated in real time (including most recently by fMRIs), so we know that something is happening there. Most significantly perhaps, cortical microstimulation experiments seem to have induced modifications in the working memory of macaque monkeys, “inducing a phenomenology,” in John Bickle’s terms.³⁹ The neurophysiologist Ranulfo Romo speaks of the possibility of quantifying the causal link between perception and neuronal activity, whether this activity and the ensuing behaviour are produced by a “material” stimulus or by the “illusion” of cortical microstimulation.⁴⁰ Future developments in neuroscience, such as illustrations of neural plasticity, can only render the IT or any materialist theory more diverse and more interesting.

Hence the IT’s claims, whether of the more empirical or the more conceptual sort, seem to be being borne out. However, should this lead us to assume, like Carl Vogt in the 1840s or U.T. Place in 1997, that materialism is simply a kind of facilitator for the advent of a triumphant brain science? No, for at least two reasons. One is the diversity of materialist projects; the other is the ease with which neuroscience overconfidently thinks it can take over philosophical problems without regard for categorical differences (we won’t name names). I sketch out a particular case for how to be a more pluralistic materialist while allowing for ‘neurophilosophical’ moves of naturalization in the next chapter, on phantom limbs, the first-person perspective, and prospects for an embodied materialism.

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³⁹Bickle (2003) and Bickle and Ellis (2005).

⁴⁰See Romo et al. (1998), 387–388 and their (2000), 276, Liu and Newsome (2000) and Cohen and Newsome (2004), 170, 173 and the commentary in Bickle (2003), 206, 210 et 198 (thanks to John Bickle for his advice here). Additionally, see Wickersham and Groh (1998), R412–413.

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⁴¹* I wish to thank Dr. M.-C. Wright of the University of Leeds for providing me with a copy of U.T. Place's paper.

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Chapter 8

Phantom Limbs and the First-Person Perspective: An Embodied-Materialist Response

Abstract In the interest of articulating a materialist theory of self in which self and brain are ‘correlates’ in the broad sense that they form part of a meaningful, integrated whole, I take the case of phantom limb syndrome. When considered in a philosophical light, such phenomena might seem to imply the necessity of the *first-person perspective*, a key insight of the phenomenological tradition, in Husserl and Merleau-Ponty in particular. But it is possible to formulate a *materialist* response to this first-person challenge. For this response to be effective, it will have to take integrate a notion of *embodiment*. However, in order to not to reinvest brain or body with the mysterious character that the materialist approach has stripped from the ‘first person’, the vision of the brain here must also be an *embedded* vision, as Andy Clark calls it, that is, locating brain not just in an embodied context but also in the social world, in the network of symbolic relations (what I call, following Lev Vygotsky, the “social brain”). A self which is the product of the brain, a brain which is intentional and embodied, and both as correlates of a materialist theory of self: this is what I attempt to sketch out, taking as a particular case, phantom limb syndrome.

8.1 Introduction

From the occasional austerity of the identity theory and the more colorful but also more historically distant portrayal of the brain by, e.g. Diderot as a ‘book that reads itself’, I turn now to a contemporary case. What can a materialist philosopher say about phantom limb syndrome? At first glance, a phenomenon by which our ‘corporeal imagination’ – what La Mettrie in the eighteenth century called the “magic lantern” working within the brain, projecting images created by our memory and intellect¹ – induces us to feel pains in a missing limb might seem like profound evidence that naïve, scientific views of consciousness are false or at least useless. How could science with its measurements ever grasp the irreducibly *subjective* construction which my body is? Notice that in any case, regardless of our answer to

¹La Mettrie (1748/1960), 165. La Mettrie adds that the soul as a whole can be reduced to the workings of the imagination.

such a question, a somato-psychic phenomenon like phantom limb syndrome raises significant issues regarding good old-fashioned notions such as the *self*, and slightly less old-fashioned notions such as the tandem ‘self and brain’. Namely, if the self has already been deflated – since Hume and Nietzsche in their respective traditions, and in recent times since Dennett – what about the brain?

Our suspicions regarding nefarious neurophilosophers and other *hérauts* of scientism should be allayed, or at least mollified, by the realization that present-day neuroscience and philosophy of neuroscience is fully aware that brains can be sources of illusion, tricks on the mind, self-deception, as much as they are reliable ontological substrates of something like the self.² An intangible phenomenon like feeling the presence of a phantom limb used to be viewed, in a kind of crude reductionism, as “wishful thinking” or “mourning” on the part of the patient (following Ramachandran’s expression) but this is no longer so.³ Consider for instance the fact of volitional control of a phantom limb, as described in Ramachandran’s famous mirror box experiment (which he also describes as the “virtual reality box”) and its implications for an integrated vision of body, mind and brain.

The box is made by placing a vertical mirror inside a cardboard box with the roof of the box removed. The front of the box has two holes in it, through which the patient inserts his good arm and his phantom arm. The patient is then asked to view the reflection of his normal hand in the mirror, thus creating the illusion of two hands, when in fact [he] is only seeing the mirror reflection of the intact hand. If he now sends motor commands to both arms to make mirror-symmetric movements, he will have the illusion of seeing his phantom hand resurrected and obeying his commands, i.e. he receives positive visual feedback informing his brain that his phantom arm is moving correctly (Ramachandran and Hirstein 1998, 1620).

Now, in what follows my aim is less to stake out a position on phantom limbs (real? imagined? material? neuronal? phenomenal?) than to show that philosophical reflection on brains, even when it seeks to rebut the dogmatic anti-naturalism found in most corners of phenomenology, does not have to be naïvely, crudely reductionistic or scientistic – in other words, to show that one can be a materialist without having to feel like “a cop at Woodstock” (in Dennett’s colourful expression)⁴, a figure of the materialist I hope will also be familiar from Chapters 1, 4 and 5.

My argument runs as follows:

1. What do phantom limbs seem to imply? The *first-person* perspective.
2. But a materialist response to this first-person challenge is possible. Further, it has to be an *embodied* materialist response.

²See Feinberg and Roane (1997) and Hirstein (2005) (an important work which addresses several of the concerns in the present chapter). For a different perspective on phantom limb syndrome and the problem of subjectivity, see Gaukroger (2014).

³Ramachandran et al. (1996); Ramachandran and Hirstein (1998); see also Ramachandran and Rogers-Ramachandran (2000).

⁴Dennett was actually referring to being a reductionist materialist philosopher at a meeting on quantum physics and consciousness; but he added that he wanted to be like a “good cop” (Dennett 1998, 97).

3. However, in order to not to reinvest the brain with the mysterious character that the self has lost, this must also be an *embedded* vision of the brain, not just in the body but in the network of symbolic relations. One can describe this as the ‘social brain’, and emphasize the coeval, co-originary relation between organ and prosthesis, so that the difference between an original substrate and an artifact disappears or becomes purely instrumental. This is what I mean by “de-ontologizing the brain.”

8.2 First-Person Privilege?

Phantom limbs and anosognosias – cases of abnormal presence or absence of parts of our body – seem like handy illustrations of an irreducible, *first-person* dimension of experience,⁵ of the sort that will delight the phenomenologist, who will say: aha! there’s an empirical case of self-reference which externalist, third-person explanations of the type favoured by deflationary materialists, *cannot explain away*, cannot do away with. In an intuition Merleau-Ponty will appeal to (and Varela after him), there is something about my body which makes it irreducibly *my own* (*le corps propre*). Whether illusory or not, such images (phantoms) have something about them such that we perceive them as our own, not someone else’s (well, some agnosias are different: thinking our paralyzed limb is precisely someone else’s, often a relative’s). One might then want to insist that phantom limbs testify to the transcendence of mental life! Indeed, in one of the more celebrated historical cases of phantom limb syndrome, Lord Horatio Nelson lost his right arm in a sea battle off of Tenerife, and suffered from pains in his phantom hand. Most importantly, he is said to have declared that this phantom experience was a “direct proof of the existence of the soul”⁶ – the clearest possible statement of the kind of view I wish to oppose here.

Although the materialist might agree with the (reformed) phenomenologist to reject dualism and accept that we are not *in* our bodies like a sailor in a ship (the real Descartes was much more bothered by the problem of the *union* of body and soul than the ‘textbook Descartes’ was⁷), she might not want to go and declare, as Merleau-Ponty does, that “the mind does not use the body, but fulfills itself through it while at the same time transferring the body outside of physical space.”⁸ This way of talking goes back to the Husserlian distinction between *Körper*, ‘body’ in the sense of one body among others in a vast mechanistic universe of bodies, and *Leib*, ‘flesh’ in the sense of a subjectivity which is the locus of experience – which may sound like an appealing distinction, but fails thoroughly in doing justice to, inter

⁵ See Feinberg and Roane (1997).

⁶ As quoted in Ramachandran and Hirstein (1998), 1604.

⁷ On the union see Hutchins (2015) and Simmons (2013), and on the ‘sailor in the ship’ image see here Chapter 4.

⁸ Merleau-Ponty (1963), 208–209 (trans. modified).

alia, the complexity of early modern mechanism faced with the question of living beings; the fascination with automata as ‘models’ of life; the biological vivacity of contemporary ‘neo-mechanism’, and so on.⁹

Now, granted, in cognitivist terms one *would* want to say that a representation is always *my representation*, it is not ‘transferable’ like a neutral piece of information, since the way an object appears to me is always a function of my needs and interests. What my senses tell me at any given time relies on my interests as an agent and is determined by them, as described by Andy Clark, who appeals to the combined research traditions of the psychology of perception, new robotics, and Artificial Life.¹⁰ But the phenomenologist will take off from there and build a full-blown defense of intentionality, now recast as ‘motor intentionality’ (discussed by neuroscientists such as Alain Berthoz and Marc Jeannerod and philosophers such as Sean Kelly¹¹), a notion which goes back to Husserl’s claim in *Ideas II* (Husserl 1989) that the way the body relates to the external world is crucially through “kinestheses”: all external motions which we perceive are first of all related to kinesthetic sensations, out of which we constitute a sense of space. On this view, our body thus already displays ‘originary intentionality’ in how it relates to the world.

This is part of what I mean by the appeal to the first-person dimension. In contrast, for someone like Dennett, phantom limbs and agnosias are, at least as much as they are instances of self-reference, instances of self-deception: *we don’t have a transparent relation to ourselves*, “you are *not* authoritative about what is happening in you, but only about what *seems* to be happening in you,”¹² or, as Andy Clark puts it, “the conscious self is but the tip of the ‘I’ berg.”¹³ Phantom limb phenomena merely bring to a light a much wider sense in which we live in ‘intended’ rather than ‘actual’ worlds,¹⁴ i.e., we presuppose an enormous amount of what is there in order to act. Put in an extreme way, “your own body is a phantom, one that your brain has temporarily constructed purely for convenience.”¹⁵ Given this, it’s not a good idea – at least ontologically; the ethical story is different, as Locke saw (and his response was to emphasize that ‘person’ was a “forensick term”) – to trace everything back to a central, unifying and grounding self(hood):

For your entire life, you’ve been walking around assuming that your ‘self’ is anchored to a single body that remains stable and permanent at least until death . . . yet these results suggest the exact opposite – that your body image . . . is an entirely transitory construct that can be profoundly altered with just a few simple tricks.¹⁶

⁹ See the references to early modern automata and the problem of organic life in Chapter 4.

¹⁰ See Clark, *passim*, and on the philosophical implications of an ‘embodied robotics’, see Symons and Calvo (2014).

¹¹ Kelly (2002), Jeannerod (2006), and for a recent review, Delafield-Butt and Gangopadhyay (2013).

¹² Dennett (1990), 96.

¹³ Clark (2002), 100.

¹⁴ Borrowing this formulation from Chris Frith.

¹⁵ Ramachandran and Blakeslee (1998), 62.

¹⁶ *Ibid.*

Our self – and its neural correlates – is a *construct*, at most a “narrative center,”¹⁷ and by that token, it’s a *fiction* (as first seen by Hume, and also Montaigne). I am a character in a story my brain is making up, “consciousness is a property I have by virtue of my brain’s attributing it to me. My story doesn’t have to cohere completely to be useful.”¹⁸ Katherine Hayles calls this new intuition “posthuman”: “Consciousness for the posthuman ceases to be seen as the seat of identity and becomes instead an epiphenomenon, a late evolutionary add-on whose principal function is to narrate just-so stories that often have little to do with what is actually happening.”¹⁹ The self here has come in for some revision! This is also the case in Gazzaniga’s famous split-brain studies (severing the corpus callosum in the case of certain seizures): in commissurotomy subjects, it is not the ‘whole person’ who does the reintegrating of their world, but one hemisphere of their brain; “the person is utterly unaware of the tricky communicative ploys the brain comes to exploit.”²⁰

This was arguably already Kurt Goldstein’s point – namely, that it is simply a ‘fact’, a ‘property’ of our brains that they construct unity or totality, as a normal state but also in response to abnormal situations²¹ – but he *ontologized* it into a property of the brain and by extension of ‘the organism’ that somehow removed it from the world of causality and mechanistic natural science. I won’t go along with the ontologization, but before coming to that point, I’d like to put some more nails in the coffin of the (admittedly ‘undead’) *first-person perspective*.

As I said initially, phantom limbs and related phenomena seem like ideal cases for the phenomenologist (whether slightly favourable to a naturalistic viewpoint or not), of a bodily state in which the viewpoint of the subject is an irreducible part of the state, such that if it were factored out, that ‘state’ would no longer make any sense, indeed would no longer exist.

8.3 An Embodied-Materialist Response

The ‘trivially true’ materialist response here would be to say: these are cases of ‘remapping’ the inner ‘model’ of the body we have, known as the cortical map²² or the Penfield map (after the Canadian neurologist, Wilder Penfield), caused by mismatches between visual and proprioceptive feedback. In other words, these apparently uniquely ‘mindful’ phenomena are nonetheless mechanistically specifiable

¹⁷Dennett (1990), ch. 13, esp. 426–427; Dennett (1992); Damasio (1999), ch. 7.

¹⁸McDermott (1992), 217.

¹⁹Hayles (2002), 319.

²⁰Dennett (1984), 40, n. 23, referring to Gazzaniga and Ledoux (1978). See also, *inter alia*, Gazzaniga (1998).

²¹See Goldstein (1995 [1934]). In modern neuroscience Goldstein’s role as predecessor of more recent split-brain studies was noted by Geschwind (1965). For a good overview see Ferrario and Corsi (2013).

²²See Humphrey (1992), 171–176, here, 172.

and explainable. Ironically, this is not so far removed from Descartes' position on phantom limbs: we shouldn't trust the senses but rather our reason. He viewed phantom limbs as *illusions*, which tells us that the problem of phantom limbs *is* the mind-body problem, since it demands that we define the relation between a sensation and 'that of which it is a sensation'.²³

The variant of the materialist response that I shall offer here can include such deflationary elements, but I would add that (1) insofar as such accounts refer back to the uniqueness of our subjective experience, they run into the aporia of opposing the first-person perspective to the third-person perspective and (2) insofar as the present version of materialism allows for *embodiment*²⁴ (and is thereby not just a physicalism), it can accommodate such experiences without having to explain them in first-person terms.

8.3.1 *Problems with the First Person*

To lay out the third-person, externalist perspective, it's always helpful to remember that there is no homunculus:

The cardinal background principle [for the neurophilosopher] is that there are no homunculi. There is no little person in the brain who 'sees' an inner television screen, 'hears' an inner voice, 'reads' the topographic maps, weighs reasons, decides actions, and so forth. There are just neurons and their connections. When a person sees, it is because neurons, individually blind and individually stupid neurons, are collectively orchestrated in the appropriate manner.²⁵

And there are no qualia either. As Dennett has memorably written, believers in qualia are tied to a picture of the mind as a 'Cartesian theatre', in which mental entities are on display before the mind's eye. To move from, e.g., the reality of colors as properties of physical objects to the reality of color qualia as the properties of internal states is an unjustified inference.²⁶ One can add that the notion of 'phenomenal information' is doubtful – perhaps interesting, and heuristically useful, but in no way more real than the 'rational part of the soul'.

Thomas Nagel's famous appeal to subjective experience in "What is it like to be a bat?" (Nagel 1974) is an elegant revival or recycling of the phenomenological vulgate from the Continent, a 'minimal credo' one could find in Bergson, Merleau-Ponty or even Husserl, but *it is not an argument* to assert that 'the mental is subjective and science is objective, therefore science cannot explain the realm of the mental (and materialism is false)'. This is logically true in the same way that 'All

²³ See Descartes to Plempius for Fromondus, 3 October 1637, AT I, 420, quoted in Gaukroger (2006), 332, n. 18.

²⁴ For more on the 'embodiment' paradigm in cognitive science, see Varela et al. (1991), Clark (1997), Chemero (2009), Shapiro (2010).

²⁵ P.S. Churchland (1986), 406.

²⁶ Dennett (1988).

Martians are adulterous, and all adulterous people are meat eaters, so all Martians are meat eaters' is true, but it says nothing more. In fact,

Human and other subjects can have functionally or computationally different states that nonetheless home on the same objective state of affairs, either external or internal. But there are no intrinsically subjective or perspectival facts that are either the special objects of self-regarding attitudes or facts of 'what it is like'. There are only states of subjects that both function in a particularly intimate way within those subjects and have the subjects themselves and their other states as inevitable referents. And that is all there is to 'subjectivity'.²⁷

Diderot had already noted that an analysis of dreams was "important, not just in medicine but in metaphysics, *because of the objections of the idealists*": why? Because of the idealists' appeal to our "inner sense" of ourselves: an analysis of dreams would reveal how easily we can be deluded.²⁸

8.3.2 *Embodying Interiority*

Moving further towards 'embodiment', Paul Churchland has pointed out that we can claim to have a first-person, privileged relation to *all sorts* of physical things, including our muscles, skin, stomach and bowels (!), what Patricia Churchland has elegantly called "awareness of visceral circumstance."²⁹ Curiously – and doubtless without the Churchlands' knowing it – Leibniz entertains this possibility in the *New Essays Concerning Human Understanding* (Leibniz 1704/1996), asserting that "something occurs in the soul in response [to] the internal motions of the viscera" (II.i.15), perhaps in response to Descartes' remarks in the *Sixth Meditation* on how my experience of bodily processes includes "twitching in the stomach" (AT IX, 60). But Leibniz, heading off objections to animism, says the soul is actually unaware of such movements. In any case, the point here is that purely internal, 'private' events which only I can feel, are in no way separate from the natural, causal world which science studies. Of course, while muscular or visceral motions can be studied from a third-person perspective, in terms compatible with the scientific representation of the world, we can also claim to feel things about them which this representation cannot include. Specifically,

The existence of a proprietary, first-person epistemological access to some phenomenon does not mean that the accessed phenomenon is nonphysical in nature. It means only that someone possesses an information-carrying causal connection to that phenomenon, a connection that others lack.³⁰

The materialist can accept that we have "a route of epistemological access" to our own body, which others lack (this is not Merleau-Ponty but David Armstrong!),

²⁷Lycan (1990), 126.

²⁸"RÊVE, s. m. (*Métaphysique*)" (*Enc.* XIV, 228).

²⁹P.S. Churchland (1988), 282.

³⁰P.M. Churchland (1995), 198.

and thereby also to our mind.³¹ But it must be *explained*: “there remains a genuine obligation on the materialist’s part to give some account of the subjectivity or perspectivalness or point-of-view-ness of the mental”; “the materialist owes the world an explanation of what it is about a mental/neural state that makes its proprietor think of it as subjective.”³²

In other words, instead of denying the existence of introspection, the materialist should try and locate it within the physical world, within the overall framework of explanation (as Spinoza did: “the order and connexion of ideas is the same as the order and connexion of things” – which one can see as opening up a ‘relational ontology’³³). One place to start, where philosophy still has to catch up on neuroscience, despite brief and passing remarks by the identity theorists, as I discussed in Chapter 7,³⁴ is proprioception, precisely inasmuch as it is my ‘internal’ sense of my body and yet is light-years removed from any aprioristic vision of an “inner sense” or “sense of senses” as found in St. Augustine, Kant or the phenomenologist Erwin Straus (see Straus 1989). The American poet Charles Olson was perhaps alone in recognizing the import of this concept, speaking of “the ‘body’ itself . . . by movement of its own tissues, giving the data of, depth,” “spontaneously [producing] experience of, ‘Depth’, *viz.* SENSIBILITY WITHIN THE ORGANISM BY MOVEMENT OF ITS OWN TISSUES,” and he described the body as an “interior empty place filled with ‘organs’? for ‘functions’?”, which (sounding suddenly very Germanic) “removes the false opposition of ‘consciousness’.”³⁵

What proprioception – among other biological phenomena – tells us is that even if we were restricting ourselves to ‘biological talk’, we would end up with some account of our subjective relation to the world, of our sense of ‘self’ in the midst of our experience of the world. Further, it would equally be within the province of biological discourse to describe how we construct partial versions of the world for ourselves (as described at the level of perception by the neurophysiologist Walter Freeman).³⁶ One way of explaining this is to view our perceptual processes as *filters*, which “take in and retain only a tiny and tendentiously selected fraction of the infor-

³¹D.M. Armstrong, in Armstrong and Malcolm (1984), 112. See Armstrong (1968), 100–115, for the materialist’s reconstruction of introspection.

³²Lycan (1990), 110, 116.

³³Spinoza, *Ethics*, II, prop. 7. For more on such a ‘relational ontology’ see Morfino (2006) and my discussion in Chapter 5.

³⁴Smart (2000) and Armstrong, in Armstrong and Malcolm (1984), 110–112. Admittedly, most of the cognitive science discussions of proprioception seem to miss its philosophical implications, too. Clark (1997) simply says that proprioception is “the inner sense that tells you how your body is located in space” (22) and leaves it at that. Quite stimulating but without any connection to contemporary cognitive science is Heller-Roazen’s historico-conceptual study of the ‘inner touch’ (Heller-Roazen 2007).

³⁵Olson (1961–1962), in Olson (1997), 181, 182. Thanks to Homa Shojaie for helping me locate this text.

³⁶Freeman (1991, 1999) and for a new discussion of the ‘doors of perception’ from a philosophical standpoint, Wilson (2015).

mation that is available in an object under scrutiny.”³⁷ Hence no two subjects perceive the same object in the same way, including for evolutionary reasons.

Indeed, since the embodied materialist standpoint is not merely a physicalism but can appeal to biological information (which may or may not leave our sense of agency intact – the embodied materialism of a La Mettrie, for instance, was quite deterministic), it offers plenty of ways to understand individuality, selfhood or agency, from reflections on the developmental process to immunology and medicine (see Wolfe 2015 for further discussion). There is no need, then, to oppose a private (and foundational) self to the body or the brain. Instead of declaring rather dualistically that “It is man who thinks, not the brain,”³⁸ – that is, that brain events do exist but have nothing to do with the world of our experience – the reverse formulation seems more wise: “The brain thinks, not man. Man is just a cerebral crystallization.”³⁹

8.4 De-Ontologizing the Brain

If embodied materialists such as La Mettrie and Diderot were both deeply committed to a demystified, naturalistic picture of the universe, *and* to a recognition of the inseparably ontological and scientific ‘disturbance’ created by the appearance of the modern biological sciences (see above Chapters 4–6), it is also true that philosophers of cognitive science such as Andy Clark have no difficulty in doing justice to ‘fleshly’, embodied agents without requiring any cumbersome metaphysical baggage, theory of subjectivity and/or of first-person experience, or otherwise ‘biochauvinistic’ commitments (Clark 2008a). The trick is to *not go all the way* with embodiment, so as not to end up in what Deleuze, speaking of Merleau-Ponty, called the “mysticism of the flesh.”⁴⁰ Surprisingly, even prominent Marxist thinkers like Antonio Negri take this Merleau-Pontyan mysticism of the flesh on board:

the raw material of the multitude is the flesh, i.e. that common living substance where the body and the intellect coincide and are indistinguishable. Merleau-Ponty writes: ‘Flesh is not matter, nor mind, nor substance. In order to designate it we need the old and new term element, in the same sense as this term was used to speak of water, air, earth and fire, i.e. in the sense of a general thing —a sort of embodied principle . . . Flesh is in this sense an element of Being’.⁴¹

³⁷ Lycan (1990), 117.

³⁸ Straus (1989), 183.

³⁹ Deleuze-Guattari (1991), 197–198.

⁴⁰ For explicit mystical statements about ‘Flesh’ see e.g. Merleau-Ponty (1962), 212: “Just as the sacrament not only symbolizes . . . an operation of Grace, but is also the real presence of God . . . in the same way the sensible has not only a motor and vital significance but is a way of being in the world . . . sensation is literally a form of communion.” I discuss this further in Chapter 4 above.

⁴¹ “Towards an Ontological Definition of the Multitude,” in Negri (2008), 118. Thanks to Katja Diefenbach for first pointing this out to me.

After all, is there anything metaphysically unique about flesh, skin or the brain which makes them do what they do? We might, then, *not get too comfortable with embodiment either*, since the brain is necessarily located within the social and symbolic world: this is what I mean by ‘de-ontologizing the brain’.

Namely, if we demystify or deflate some concepts of self and subjectivity by relating such concepts to the reality of the brain – the processes of which are dynamic, distributed, non-centred, dissipative, and include ‘remapping’ –, we shouldn’t then turn the brain itself into a mysterious substance which explains everything, some sort of ‘Wonder Tissue’; a corrective is needed. If mind and body belong together, as do body and brain, so do brain and *world*. Call this the “co-evolutionary” perspective (Deacon 1997) and emphasize ‘Baldwinian evolution’, i.e., the cluster of linguistic and cultural layers in evolution which do not fall under Darwinian evolution; call it the “social brain,” in the Spinozist tradition (including Damasio but also Lev Vygotsky and Toni Negri⁴²). Spinoza declared, as we saw earlier, that the order and connexion of *ideas* is the same as the order and connexion of *things*; he also says that “the order of the actions and passions of our body coincides in nature with the order of the actions and passions of the mind.”⁴³

Not everything is ‘in the head’; the skin is not a ‘real barrier’ (think of how much we *care* about extended limbs, how upset we get if they are severed, including even remote-controlled limbs). This is what Andy Clark calls “scaffolding”: we are inseparable from the “looping interactions” between our brains, our bodies, and “complex cultural and technological environments.”⁴⁴ In other words, our brains have the talent for making use of the environment, “piggy-backing on reliable environmental properties,”⁴⁵ which is in fact a far more economical and *swift* action procedure than processing representations of objects. “Scaffolding” is one of the vehicles humans employ, so that language, culture and institutions *empower* cognitions.⁴⁶ On this view, the brain is not a central planner but possesses a “scaffolding” which is inseparable from the external world.

Think of it in terms of plasticity: the possibility, as described in Ramachandran’s mirror box experiment, of reviving volitional control and somatic sensations in a phantom arm by simply using a mirror, even when no sensation had been experienced by the subject for the previous ten years, “implies a surprising degree of plasticity in the adult brain.”⁴⁷ And this plasticity implies in turn a surprising degree

⁴²On the Baldwin effect see Depew and Weber eds. (2003); on the idea of the social brain, see Virno (2001) and Wolfe (2010b); some of the recent interest in Gilbert Simondon touches upon this.

⁴³Spinoza, *Ethics*, III prop. 2 scholium.

⁴⁴Clark (2002), 11, 43. Clark intersects here with a good deal of recent cultural, literary and media theory (when it concerns itself with the relation between fiction, embodiment and technological forms) – see in particular Haraway’s “cyborgs” (Haraway 1991) and Hayles’ “posthuman” subjects (Hayles 1993, 1999, 2002). But Clark is unique in that he speaks from *within* cognitive science – which also entails that there is no utopian dimension to his theory (see also Clark 2008b).

⁴⁵Clark (1997), 45.

⁴⁶*Ibid.*, 21, 87.

⁴⁷Ramachandran et al. (1996), 34.

of opportunistic openness towards the non-organic, the artificial, the technological: the biological functioning of our brains themselves “has always involved [using] nonbiological props and scaffolds,”⁴⁸ with direct consequences for brain architecture itself: “a youngster growing up in a medieval village in twelfth-century France would literally have different neural connections than a twenty-first-century American adolescent who has spent serious time with computer games.”⁴⁹ In Deleuze’s terms, “Creating new circuits in art means creating them in the brain.”⁵⁰

In any case, I don’t wish to take a position in the current debates on the status and importance of neural plasticity,⁵¹ but rather to emphasize the ‘scaffolding’ dimension, which implies that the ‘paradigm’ of the phantom limb might not be not so far removed from that of the *prosthesis*. Given the degree of openness of the central nervous system, and on the ‘personal’ level, our ability to identify with *non-biological* extensions of our body, the ‘artificialist’ perspective, in which body and prosthesis, indeed, body and tool, *merge*, is not so far off. Just as the ‘fictional self’ is the outcome of the deflation of the ontological unity of self, the social, evolving, ‘cultured’⁵² brain deflates the ontological uniqueness and isolation of the brain. Instead of opposing subjectivity to the natural world, or the body to the tool, we have arrived at a vision of the “productive potential” of the agent as inseparable from a “set of prostheses,”⁵³ in a process of what Félix Guattari would have called the “production of subjectivity.” In Negri’s terms,

The tool ... has entirely changed. We no longer need tools in order to transform nature ... or to establish a relation with the historical world ..., we only need language. Language is the tool. Better yet, the brain is the tool, inasmuch as it is common.⁵⁴

Brains are culturally sedimented; permeated in their material architecture by our culture, history and social organization, and this sedimentation is itself reflected in cortical architecture, as first clearly argued perhaps by the brilliant Soviet neuropsychologist Lev Vygotsky in the early twentieth century (a major figure in fields including social psychology, developmental psychology and a kind of heretical Marxism – but one not afraid to invoke the brain). Vygotsky strongly emphasized

⁴⁸ Clark (2002), 86.

⁴⁹ Hayles (2002), 300.

⁵⁰ Deleuze (1995), 26.

⁵¹ Contrast Steven Quartz & Terry Sejnowski’s “neural constructivism” (essentially a kind of ‘hyper-plasticity’) with Gazzaniga’s insistence that we actually have *less* plasticity than is currently thought. Further, consider the ‘new innatist’ point that phantom limbs imply the existence of internal representations of our body which we are *born* with (e.g., the fetus which knows how to put its thumb in its mouth without ‘putting out its eye’). Another, more cautionary response to invocations of plasticity is to point out that cortical remapping is not always a good thing! For an historical overview of neuronal plasticity see Berlucchi and Buchtel (2009), and Huttenlocher (2002) for the contemporary discussions.

⁵² On the ‘cultured brain’ see Neidich (2003). A ‘Deleuzean approach’ to the brain is a significant component of Neidich’s analysis; for a helpful discussion of Deleuze on the brain see Rajchman (2000), 133 f., 136–138.

⁵³ Negri (2000), § 16b.

⁵⁴ *Ibid.*

the embeddedness of the brain in the social world, arguing that there may even be evidence of consequences in our central nervous system derived from early social interaction, so that past experience is embodied in synaptic modifications; as his collaborator Alexander Luria put it, “Social history ties the knots that produce new correlations between certain zones of the cerebral cortex.”⁵⁵ Less dramatically stated, the cognitive archaeologist Lambros Malafouris writes that “Our minds and brains are (potentially) subject to constant change and alteration caused by our ordinary developmental engagement with cultural practices and the material world” (Malafouris 2010). Notice that this is materialism *sensu stricto*, as it is a description of the properties of brains.

But this is not exactly materialism of the ‘nefarious neurophilosopher’ sort, in which experimental neuroscience comes to replace philosophy, whether in a *vulgär-materialistisch* sense, or in that of U.T. Place, as discussed in Chapter 7, in which materialism meant that “the mind-body problem is about to pass from the grasp of the philosopher into that of the neuropsychologist” (Place ms. 1997, 16). Instead, the mind-brain materialism of Vygotsky, for whom “History, changing the human type, depends on the cortex; the new socialist man will be created through the cortex; upbringing is in general an influence upon the cortex”⁵⁶ is both less passive and less mechanistic. In this sense it is not a ‘scientism’ or a denial of the symbolic and valuative dimensions of life, as we are still told about materialism (e.g. Hawkes 2011, which warns against the danger of materialism in the humanities, claiming that it will destroy the symbolic, valuative, representational content in literature). Rather, following a helpful and suggestive response of Sutton and Tribble, materialism need not claim that ‘only matter exists’, it can be “firmly pluralist” in its ontologies: “Even if all the things that exist supervene on or are realized in matter, the materialist can still ascribe full-blown reality to tables and trees and tendons and toenails and tangos and tendencies”; an account including the brain need not exclude “memories, affects, beliefs, imaginings, dreams, decisions, and the whole array of psychological phenomena of interest to literary, cultural, and historical theorists” (Sutton and Tribble 2011).

The materialism of the ‘cultured brain’ (as in Vygotsky or recent work in cognitive archaeology or tools, Iriki 2009) is very much of this sort: it integrates the brain and the affects, cerebral architecture and our aptitude to produce fictions... But notice that it is not enough to rebut these ‘antelapsarian’ visions of a cold, dead materialism seizing living value, sentiment and meaning in its embrace and reducing them to piles of inert matter.

⁵⁵Luria (1967/1978), 279/Luria (2002), 22. Iriki’s research can be seen as a recent illustration of this.

⁵⁶Vygotsky, *Pedagogija Podrotska* (1929), quoted in van der Veer and Valsiner (1991), 320. Further discussion in Wolfe (2010b).

8.5 Conclusion

The brain is “common” inasmuch as it is constituted by and inseparable from the network of relations to which we belong. If phantom limb syndrome was the point of entry here by which the brain opens onto the world of fiction, revealing our sense of self, including its ‘embodied’ dimension, to be a “transitory internal construct,” in Ramachandran’s terms, then the prosthesis (a bit like the figure of the cyborg) is the point at which the brain escapes any solipsism, whether of the post-Cartesian, brain-in-a-vat sort, or the more omnipotent, brain-as-self sort. Self and brain are constituted through interactions with various extended entities, so that *what it is to be ‘me’ is nothing other than a productive potential*, a “set of prostheses,” of fictions. The common brain or social brain generates what we might call the fictional self, but really, the fellow-traveler of such a self should be termed the *de-ontologized brain* – a brain that is neither ‘wonder tissue’, nor requiring a ‘regional ontology’ of its own (which need not mean it reduces to pure physics). Now, one can ask in response if a de-ontologized brain can ‘think ontologically’, and the initial response seems to be No: if an ontology amounts to a definition or catalogue of what there is, as opposed to what there isn’t (tables, chairs, bodies and maybe mathematical entities, but not centaurs or smiles of Cheshire cats), then brains as entities ‘plugged in’ to the network of artificialist, technological production shouldn’t think ontologically at all. However, if one understands ontology in a sense closer to the “production of subjectivity,” namely, as “constitutive ontology,” in Negri’s terms, then there is no tension between a plastic, social, cultured brain-in-a-network and the constant production and reproduction of being, through the desires and actions of concrete agents.⁵⁷ If what there is, is *constituted*, the brain’s positing and desiring are *no more* real than the fictional, “forensick” masks of the self, but they are also *less* real than the social, ethical and political forms into which they crystallize.

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⁵⁷Hardt and Negri (2000), 362. For more on Negri’s notion of “constitutive ontology,” see Wolfe 2007 and Wolfe 2010.

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Chapter 9

Conclusion

Abstract I reflect here on the diversity of forms of materialism and their possible conceptual unity. Features which seem to be shared across historical and scientific contexts include: anti-foundationalism, anti-essentialism, a willingness to endorse reductionist explanations and of course various combinations of naturalism and programs for ‘naturalization’. In contrast, the relation to scientific experiment and (conversely) to metaphysics is not a stable issue in materialist philosophy.

9.1 General Remarks

We have seen a great deal of diversity under the heading of ‘materialism’ in the history of philosophy, and in roughly contemporary philosophy – without, of course, having been able to discuss all of its forms, or even all of the truly important episodes. Anthony Collins and Joseph Priestley deserve much more attention, the former notably with regards to emergentist arguments, the latter not least because of his elegant way of combining materialism with his radical Christian convictions. Indeed, the interrelations between atheism and materialism, whether in a specific early modern context, or in a more conceptual vein, deserve vastly more study (for a preliminary sketch see Wolfe 2015). If this book had exclusively treated the early modern context, it would have featured further discussion of authors including Gassendi and Locke (but they have at least been studied in relation to materialism by noted scholars including Olivier Bloch and Udo Thiel). Similarly, if the scope had not necessarily been fairly large, the German context (of the sort studied by Paola Rumore and Falk Wunderlich) would have, one hopes, received due mention. The list could go on. But the diversity of materialism leads me to some different, more systematic points as regards the analyses I have proposed in the preceding chapters.

As concerns materialism as either a ‘discontinuous tradition’ or a coherent philosophical position, my first remark is that the absence of an absolute, monolithic incarnation of materialism should lead some of its refutations to ‘break their teeth’ on the aforementioned diversity – for example, I suggested some years ago that standard anti-naturalist arguments did not work against Diderot’s form of naturalism, articulated in relation to natural history in general and to its necessarily artificial cognitive constructions in particular (Wolfe 2009). But this diversity is not necessarily at the service of partisan defenders of materialism, either, for these either seem to be promoting quite pallid, limited versions of this position, or seem

(again) unaware of the diversity. Yet, as I have emphasized at different points in earlier chapters, out of this diversity some stable conceptual features emerge.

Materialism is anti-foundationalist, anti-essentialist, and does not shy away from the power of reduction (whether this be applied to the immortality of the soul, qualia, freedom as indifference, etc.). The anti-foundationalist aspect is clear enough: even a natural scientist like Buffon was intimately involved with metaphysical considerations (“everything that can be, is”); yet he also insisted in a recognizably post-Baconian manner that an investigation of Nature should no longer ask ‘why?’ but ‘how?’. Similarly, a more clandestine figure, the materialist curate Jean Meslier, in his *Mémoire* which was written about 20 years prior to Buffon’s *Histoire naturelle* (but barely circulated), was quite critical of the claim that prior states of the world can be deduced from its current properties: “there is no foreign cause which can willingly make possible that which is impossible, or make the possible, impossible.” Diderot’s comment is that “only Revelation” can really address the “most troublesome” question, “*why is there something?*”¹

At least since Epicurus and Lucretius (for whom there was no beginning prior to atoms and the void), and very prominently in the Radical Enlightenment authors, the question of ultimate foundations, the origin of the world, first principles and such, is held to be *hors jeu*. The idea that, as Althusser put it, the world is prior to the thinker, and “the materialist philosopher is the one who catches an already moving train”² has provoked anti-materialist hostility for a long time (one thinks of how emphatically Cudworth, to name one among many, insists that the world of the mind is not “junior to things”; it is instead the mind which is “senior to the world”: Cudworth 1678/1977, I, ch. IV, 679, 736–737). At this point, the contemporary philosopher can confidently introduce another term of art: isn’t this view that there are no axioms, no first philosophy, no absolute beginnings, simply naturalism? (Armstrong 1978). After all, Althusser’s portrayal of the materialist philosopher as entering into the story by catching a moving train, sounds a lot like Quine’s statement from roughly the same year:

The naturalistic philosopher begins his reasoning within the inherited world theory as a going concern. He tentatively believes all of it, but believes also that some unidentified portions are wrong. He tries to improve, clarify, and understand the system from within. He is the busy sailor adrift on Neurath’s boat.³

Yet there is a difference between materialism in the story (or succession of episodes) I have presented, and this form of naturalism, which at the ‘basement level’ defers to physics as the source of its ontology (physicalism, according to which “the fundamental objects are the physical objects”: Quine 1979, 163). As such, I shall

¹ Buffon (1749), “Premier discours,” and the discussion of ‘how?’ and ‘why?’ questions in *ibid.*, Bk. II, “On Reproduction in General,” ch. II; Meslier, *Mémoire* (1720–1727?), *Septième Preuve*, in Meslier (1970), vol. 2, 171, 193; Diderot, *Pensées sur l’interprétation de la nature*, § 58, “Questions,” n° 2, in Diderot (1975–), IX, 95.

² Althusser (1994) and the fine commentary of Bourdin (2005).

³ “Five Milestones of Empiricism,” in Quine (1981), 72. Neurath’s influence on Quine is well-known, indeed, the original passage in Neurath serves as the epigraph to *Word and Object*.

make two general observations, concerning materialism, the role of science and physicalism.

9.2 Materialism and the Sciences

First, given recurrent materialist assertions of the sort ‘the brain secretes thought like the liver secretes bile’, “it is difficult to produce good metaphysics or good ethics without being an anatomist, a naturalist, a physiologist and a physician,”⁴ or in a late statement of Place’s,

the long reign of the philosopher as the professional in charge of the mind-body problem is finally coming to its end. Just as has happened in the lifetime of most of us in the case of the origins of the universe which used to be a theological problem and is now an astronomical one, so the mind-body problem is about to pass from the grasp of the philosopher into that of the neuropsychologist.⁵

shouldn’t we take it for granted that materialism is always founded on scientific evidence? In fact, not, and for at least two reasons: first, it can be a speculative metaphysics of thinking and/or living matter (cf. Toland or Diderot), or a conceptual investigation of, e.g., the properties of matter and thought which wholly dispenses with experimental evidence (as in Collins, and in an odd way, the more conceptual versions of the identity theory, which make no appeal to experimental neuroscience). Émile Littré commented in his nineteenth-century medical dictionary that ancient materialism was a metaphysics which sought to explain the origin of the world, whereas modern materialism forgoes any speculation on the nature or origin of matter (Littré and Robin 1863, 908); while this is a useful distinction, Littré would need to reflect on authors including Toland, Deschamps or Diderot, who were not averse to speculation or metaphysics). Second, and perhaps more interestingly, materialism can and does make assertions and suppositions which are not directly tied to scientific progress, not just when dealing with ethico-political matters, but also when creating a metaphysics of Nature.

For instance, Diderot *does* hold that materialism should answer, eliminate, naturalize older questions about soul, mind, immortality ... *and* he thinks the new sciences (e.g. chemistry and biomedicine) help; *but* he knows the sciences of his time can’t answer these questions directly. A different, yet equally speculative aspect tends to appeal to the more ideological partisans of materialism, as in Diderot’s much-cited “do you see this egg?” in *D’Alembert’s Dream*:

Do you see this egg? With this you can overthrow all the schools of theology, all the churches of the world. What is this egg? An unsensing mass, prior to the introduction of the seed; and after the seed has been introduced, what is it then? Still an unsensing mass, for the seed itself is merely an inert, crude fluid. How will this mass develop into a different [level

⁴Respectively Vogt, as cited earlier; Diderot, *Réfutation d’Helvétius*, in Diderot (1975)-, XXIV, 555.

⁵Place (1997), 16.

of] organisation, to sensitivity and life? By means of heat. And what will produce the heat? Motion (Diderot 1975-, XVII, 103–104).

Here, the radical appeal of doctrines such as epigenesis, for properly ‘materialist’ purposes, is evident. But it is an enormous leap, or an unfounded conclusion, to think on this basis that materialism is founded on scientific evidence. As Olivier Bloch elegantly put it, science is not necessarily “the laboratory of materialism” (Bloch 1998, 459), to which one might add, ‘which science?’, since a medical materialist like La Mettrie cared nothing for physics, while theologically based materialists like Priestley cared little for the biological. One could add Spinoza, for whom it would have been the case that “the truth of the mental is in science, but not necessarily in neurophysiology.”⁶

A subsidiary version of this point, dissociating materialism and science per se, speaks more to the *history* of science: here, the observation would be that many crucial episodes which post facto, are associated with the ‘success’ (empirical? philosophical? again a question which Vogt or Place conspicuously fail to address, as Du Bois-Reymond noted so well) of scientific materialism, in fact have nothing to do with such philosophical positions. This is true both about the emergence of experimental neuroscience in the early nineteenth century, most of which was either anti-materialist or rendered philosophical debates irrelevant (Métraux 2000), and about scientific psychology. To quote Gary Hatfield:

In the standard narrative, the heroes of the Enlightenment are materialists. If psychology is to be made a science, the story goes, mind must be equated with matter and thereby rendered subject to empirical investigation. The problem is that no one bothered to tell the early practitioners of natural scientific psychology that they had to be materialists in order to be natural scientific psychologists. In point of fact, of all the major eighteenth century authors who made contributions to the development of psychology, only Erasmus Darwin allowed that mind might be material; nineteenth century founders of psychology, including Wundt, Helmholtz, Lotze, Ebbinghaus, James, Munsterburg, and Binet, banished the very question from scientific psychology (Hatfield 1994, 390).

So materialism should not be treated unproblematically or ahistorically as founded on scientific evidence: it can exist without it, and conversely, various important cases of what we might call ‘naturalization’ and/or the emergence of a scientific discipline, did not require materialist philosophy. But what about physics, and physicalism?

9.3 Physicalism and the End

I’ve given some suggestions, more or less explicit, in Chaps. 4, 5, 8 and to a lesser extent 7, as to why physics neither was, nor should be, the necessary reducing theory and thus ontological base or basis for materialism. One reason was the

⁶B. Balan, “Spinoza et la théorie de l’identité dans la philosophie de l’esprit” (1992), quoted by Gil (2000), 231.

importance of embodiment, and sciences such as medicine or the nascent biology of the later eighteenth century (although Lucretius certainly was able to derive a great deal of cosmic and ethical reflection from a consideration of atoms and the void). Another reason is that the project of a materialist metaphysics should continue to concern itself with ‘regional ontologies’ in the neurosciences, developmental biology, evolution or of course physics, without thereby signing away its possessions to the latter discipline, in which case it would become a kind of trivial truth (Levin 1979, 60). David Lewis saw this quite clearly:

A confidence in the explanatory adequacy of physics is a vital part, but not the whole, of any full-blooded materialism. It is the empirical foundation on which materialism builds its superstructure of ontological and cosmological doctrines, among them the identity theory” (Lewis 1966/1983, 105)

In addition, if materialism in its contemporary form was synonymous with physicalism, thereby tying its future to the theoretical entities articulated in physics, and if physics ends up dispensing with matter in favour of energy (in a kind of dematerialization), what happens to materialism? One historically motivated answer is that there is nothing new here, for at least since Newton, physics has been articulating an ontology of concepts such as force, which are not to be directly tied to matter (although the extent to which gravity might be material or not for Newton is controversial, as it involves partly ‘ideological’ fears of Epicureanism ... i.e. a kind of materialism), and that any scientifically founded materialism is, in Bachelard’s words, constantly in the process of new foundation.⁷ Smart, who was one of the first and most prominent figures to tie materialism to physicalism, writing, “By ‘materialism’ I mean the theory that there is nothing in the world over and above those entities which are postulated by physics” (Smart 1963, 651), seemed to hold that even with a triumphant physics, there was a place for materialism:

I do not hold materialism to be wedded to the billiard-ball physics of the 19th century. The less visualizable particles of modern physics count as matter. Note that energy counts as matter for my purposes: indeed in modern physics energy and matter are not sharply distinguishable. ... If matter and energy consist of regions of special curvature of an absolute space-time, with ‘worm holes’ and what not, this is still compatible with materialism: we can still argue that that in the last resort the world is made up entirely of the ultimate entities of physics, namely space-time points.⁸

I should like to take a step back, since my concern is not the contemporary physicalist debate in and of itself. What Quine, Lewis and perhaps Smart all see, and what they share with Collins, d’Holbach, perhaps earlier Spinoza, and definitely the more systematic French materialists such as Deschamps, is that “reality consists of nothing but a single all-embracing spatio-temporal system” (Armstrong 1978, 261 – describing naturalism). One might add a commitment to the causal closure of this space-time world, with of course the *de rigueur* denials of appeals to anything

⁷Bachelard (2000), 7.

⁸Smart (1963), 651. I cannot address physicalism in greater detail here; for an important recent assessment see Ney (2008).

supernatural or transcendent. It may be best to speak, as we were a few pages earlier, of naturalism, according to which

an adequate philosophical account of the natural world, including humans, can be given solely in terms of objects and processes occurring in the natural causal order. ... Materialism [implies ...] naturalism, but naturalists need not be reductive materialists. Thus a naturalist might deny the reducibility of psychology to biology so long as psychology itself functions as a natural science (Giere 1998, 728).

The kind of pluralism at work here can be extended further, thinking of a Deweyan naturalism (Dewey 1929), for both the IT, Giere's above definition, and Dewey's project (as well as every instance of materialism discussed in this book) are species of philosophical naturalism. The difference is that for the identity theorists, the space-time world as defined by the science of physics is what philosophy has as its basis of explanation, whereas for Dewey, the 'naturalistic' position denies the scientific statement of what is real any privilege. Science and human experience are on a continuum, as is philosophy. What is missing from this portrayal of naturalism, to do justice to the variety of thinkers discussed in earlier chapters, is notably the more 'destructive' character of their reductionism. And when 'new materialists' oppose their own sensitivity towards materiality, agency, embodiment, prostheses, or 'thingliness' overall, to a kind of 'Scientific Revolution' vision of triumphant mechanism, technology and dehumanization, well, I leave it to the reader to be the judge if that captures any of the impetus (whether theoretical or existential) of the doctrines and contexts presented in the previous chapters, including the cortical microstimulation of macaques, the proclamation of absolute social equality on the grounds of material identity, or the search for the 'socialist cortex' (Wolfe 2010).

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