Forms of Materialist Embodiment *

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Draft, 2011; revised version forthcoming in *Anatomy and the Organization of Knowledge, 1500-1850,* eds. M. Landers and B. Muñoz (London: Pickering and Chatto, 2011)

The materialist approach to the body is often, if not always understood in 'mechanistic' terms, as the view in which the properties unique to organic, living embodied agents are reduced to or described in terms of properties that characterize matter as a whole, which allow of mechanistic explanation. Indeed, from Hobbes and Descartes in the 17th century to the popularity of automata such as Vaucanson's in the 18th century, this vision of things would seem to be correct. In this paper I aim to correct this inaccurate vision of materialism. On the contrary, the materialist project on closer consideration reveals itself to be, significantly if not exclusively, (a) a body of theories specifically focused on the contribution that 'biology' or rather 'natural history' and physiology make to metaphysical debates, (b) much more intimately connected to what we now call 'vitalism' (a case in point is the presence of Théophile de Bordeu, a prominent Montpellier physician and theorist of vitalism, as a fictional character and spokesman of materialism, in Diderot's novel *D'Alembert's Dream*), and ultimately (c) an anti-mechanistic doctrine which focuses on the unique properties of organic beings. To establish this revised vision of materialism I examine philosophical texts such as La Mettrie's *Man a Machine* and Diderot's *D'Alembert's Dream*; medical entries in the *Encyclopédie* by physicians such as Ménuret and Fouquet; and clandestine combinations of all such sources (Fontenelle, Gaultier and others).

* A version of this paper was delivered at a workshop on "L'Homme-Machine", organized by K. Vermeir et al., U. Paris 7, CNRS labo SPHERE, June 2011. Thanks to Koen Vermeir for his invitation and to John Sutton and Brian Keeley for comments on an earlier version.

1.

We tend to think of the emergence of modern materialism as somehow an outgrowth, albeit a more fiery and impassioned one, of the forms of mechanism that flourished in the Scientific Revolution. Now, mechanism itself comes in a variety of forms or programmatic statements: 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.[1] As applied to the body, and thus at a more macroscopic level of resolution, Descartes states that he will assume the body is nothing other than "a statue or machine made of earth," to which he adds famous analogies with the machinery of fountains comprising moving hydraulic statues, and other sorts of clockwork (*Treatise on Man*, AT XI, 120, 130-131, 202). Most broadly of all, Herman Boerhaave, the great Leiden professor of medicine, stated in a 1703 lecture revealingly entitled "On the Usefulness of Mechanical Methods in Medicine" that "the nature of the human body is the same as that of the whole of the Universe" (Boerhaave 1703/1907, 146; Boerhaave 1983, 96), by which he certainly doesn't mean that the body has a life like that of the world-soul, or even that it is part of the one total substance of the universe as in Spinozist substance monism (a view held by committed materialists such as John Toland, for whom "every material Thing is all Things" [Toland 1704, Letter V, 192], or Diderot, for whom "everything changes, everything passes . . . only the Whole remains" [Diderot 1975-, XVII, 128]). Rather, Boerhaave is restating the essential claims of mechanism in ontologised fashion: it is not just that matter itself can exhaustively be defined in terms of shape, size and motion, or that the body can (and should) be studied as if it were a mechanistic arrangement of matter – or a machine, whichever comes first to mind – but that the body is itself the same *in essence* as the rest of the universe: mechanical.

[1] Boyle, *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.

If materialism really was an outgrowth of mechanism, a typical example would be La Mettrie's 'man-machine', which is often described, presumably by authors unfamiliar with his writings or otherwise blinded by the prevalence of older interpretive schemas, as simply as simply the Cartesian *bête-machine* extended to humans (see Thomson 1988 for an early rebuttal of this view, and Wolfe 1999 for the case of Diderot). This narrative of progression or decline (depending on whether one is a positivistically inclined historian of the behavioural sciences intent on tracing a line from Descartes to cybernetics via La Mettrie (Dupuy 2000) or a moralistically inclined philosopher intent on showing how the triumph of mechanism and/or materialism spelled the death of 'meaning and value' (Husserl 1910, Ruyer 1933, Jonas 1966)) can also be told in more theoretical terms, in which the increasing complexification of Cartesian mechanism is a necessary component of every major step forward in physiology, through Lamarck and Claude Bernard (Schiller 1978). But the point I want to retain 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, or rather to the fact of our embodiment. This is often decried by theorists who think something was lost at a certain historical conjuncture, a historico-destinal moment of 'dehumanization' or alienation (Merchant 1980, Kass 1995).

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 – 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.[2] Of course, there

[2] Hacking 2006. Notice that an entire mini-generation of prominent Descartes scholars has rejected this reading, emphasizing instead an 'embodied Descartes'; see for instance Oksenberg Rorty 1992, Sutton 2000 and, differently, Des Chene 2001. But that 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.

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 (Haraway 1991, Hayles 1993, 2002), while others in a more historical vein have emphasized the particularly *heuristic* role of automata such as Vaucanson's duck (Riskin 2003, Wolfe 2011a). But I would like to suggest a different response to this narrative, one which partly seeks to correct it on historical grounds: that there was such a thing as 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 materialists frequently repeated like a mantra that everything that is real is (a) body. Thus Hobbes: "That which is not body is no part of the universe," "there is no motion save of corporeal substance"[3] or Bacon: "In nature nothing exists besides individual bodies, performing pure individual acts according to a law."[4] Diderot gives a more explicitly reductionist cast to the claim that 'all is body', when, in a major unpublished work which occupied him during the last two decades of his life, the *Elements of Physiology*, 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, in his marginal commentary on Franz Hemsterhuis' 1772 *Lettre sur l'homme*, "wherever I read *soul* I replace it with *man* or *animal*."[5] Similarly, La Mettrie in his first philosophical work, the *Natural History of the Soul* (1745, later revised under the title *Treatise on the Soul*), declares that "he who wishes to know the properties of the

[3] Hobbes 1651, IV, § xlvi, in Hobbes 1994, 459; Hobbes 1976, ch. 37, § 4, 447.
[4] Bacon, *Novum Organum* II, ii in Bacon 1857-1874, VIII, 168.
[5] Diderot, *Éléments de physiologie*, in Diderot 1975-, XVII, 334-335; Hemsterhuis / Diderot 1772/1964, 277 [120a].

soul must first search for those which manifest themselves clearly in the body" (*Traité de l'âme*, I, in La Mettrie 1751/1987, 125). It makes sense, then, that a word that was used as a synonym for 'materialism' in the late seventeenth century, albeit not a very common one, was 'corporealism'. Ralph Cudworth describes "Corporealists" as those who "acknowledge no other *Substance* besides *Body* or *Matter*" (Cudworth 1678/1977, I, ch. III, § xxx, 135). And Furetière's influential *Dictionnaire* defines materialists, in an entry added to its 1727 edition (it was first published in 1690) as "a kind of philosophers who claim that only matter or the body exist, no other substance in the world; matter or body is eternal, and from it everything else is formed."[6]

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? If there is a materialist idea of embodiment, we need a working definition of the term. I will suggest one, borrowing hints from two distinct, and influential intellectual traditions of recent decades. Very 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* (Merleau-Ponty 1962, 104). The emphasis here usually falls 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 seems to connote 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" (Rublack 2002, 13), through scientific discourses but also in many other ways.[7] Both of these perspectives share a sense (an intuition?

[6] Furetière 1727, III, s.v. "Matérialiste."

[7] Aside 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 and in embodied cognitive science, Young 2005; for interesting and original ways of extending and modifying their programs, combining 'humoral materialism' with 'historical cognitive science', see

a theoretical commitment?) 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.

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 for embodiment discourse) exists at least in part "outside of physical space" (Merleau-Ponty 1963, 209). Thus the living body – indeed, any organism – "is an individual in a sense which is not that of modern physics" (*ibid*., 154). This is often presented in cultural studies as an insight countering 'Cartesianism'. So, Jonathan Sawday states in his impressive *The Body Emblazoned*, referring to the rise of a Cartesian mechanistic world-picture, that "As a machine, the body became objectified; a focus of intense curiosity, but entirely divorced from the world of the speaking and thinking subject" (Sawday 1995, 29). Thus present-day embodied mind theorists 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. We accordingly need an expanded notion of the physical to account for the organism or living being" (Thompson 2007, 238). As I will be suggesting, this "expanded notion of the physical" has always been present; it is rather the picture of "standard materialism" that needs to be revised.

At first blush, a deeply subjective body, or at least one in which subjectivity is somehow 'irreducible', does indeed seem a far cry from both iatromechanical and materialistic approaches to the body. But what are these?

Iatromechanism: an influential, perhaps even dominant school of medical thought in the late 17th and early 18th centuries, under the twin influences of Descartes' *Traité de l'homme* (1648) and Borelli's *De motu animalium* (1680). It is here,

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Sutton 2007 and 2010. For 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 and Gal, eds. 2010.

in this specifically medical form of mechanism, that we encounter all the 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" (Boerhaave 1752, 81). Baglivi, a celebrated Roman anatomist and surgeon, and was also a Fellow of the Royal Society in London from 1697 onwards, initially seems to recommend an *approach* to bodies rather than an ontological claim about their nature, suggesting they be studied according to "Geometrico-Mechanical Principles," but he adds that if the body's structure (*fabrica*) is approached thus, 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 (Baglivi 1696/1704, 135-136).

The London anatomist and founding member of the Royal Society William Croone says all of this quite succinctly, but without the useful metaphors: "We shall consider the living body to be nothing else but a kind of machine or automaton."[8]

Indeed, when we speak of mechanisms, the machine analogy, or in this case the specifically medical theory of iatromechanism, we 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, whether animal or human, is described as being *like a machine* (or more assertively, as in Croone's formulation cited above, "nothing else but a kind of machine or automaton"), we can feel fairly confident that we know 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 behaviour, and on some accounts intentionality or consciousness (these two tend to be

[8] Croone 1664, sect. XXVI, 15, *cit*. in Wilson 1961, 161.

associated) – are being redefined as, or reduced to basic mechanical properties. Notice that even this definition of a higher-level entity in terms of a set of 'lower-level' properties is less straightforward than we might think: are living, embodied properties being defined in favour of *the properties of machines* as they are understood at a given time and place (like Descartes' fountains), or in favour of 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 as Boerhaave did (above) that "the nature of the human body is the same as that of the whole of the Universe" (Boerhaave 1703/1907, 146; Boerhaave 1983, 96).

Instead of examining the diversity of mechanistic and reductionist explanations (to which I return below), however, I wish to 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',[9] and mechanical models of life such as Vaucanson's duck were attempts to understand … life.[10] And conversely, when we turn to the writings of the group of 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 becomes a major fictional character in Diderot's experimental philosophical novel, *D'Alembert's Dream*, which was written in 1769 and not published 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" (La Caze 1755, 2); even if the same author some pages later adds that movement and sensation are basic, non-reducible features of the body (*ibid*., 12). Of course, this goal to explain the specific workings of our organic body with appropriate concepts, rather than simply retranslating those workings into the

[9] The *Dictionnaire de l'Académie*, in 1694, defines 'machine' as "a set of parts or organs which form a whole, living or not, and produce determinate effects without transmitting a force externally; organism, body" (*cit*. in Cayrou 1948, s.v. "Machine," 530).

[10] See Vaucanson 1738/1742, Riskin 2003 and for original analyses of Vaucanson and automata in early modern Europe, Roukhomovsky, Roux *et al*., eds. 2011.

vocabulary of simple machines, is two-edged: on the one hand it is indeed exclusively structural, like a kind of expanded or enhanced mechanism (Wolfe and Terada 2008, § 4); but on the other hand it focuses specifically on the *organic* structure of the body. As another Montpellier vitalist, Ménuret, notes in his fascinating essay in Diderot and D'Alembert's *Encyclopédie*, "Œconomie Animale," the essay "Œconomie Animale," that the mechanists, *les Méchaniciens* (referring to iatromechanists as a whole) "did not even pay attention to the *organic structure* of the human body, which is the source of its main properties" (Ménuret 1765, 364b).

2.

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 ascertain 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 – which, if we think of the role played by animal spirits in Cartesian neurophysiology, seems to have also been true of various forms of 'mechanism' (Sutton 2000). 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*. I will now 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. One is its privileging of medicine, natural history and the other sciences of 'body' at the expense of physics and mathematics, which are usually presented as abstractions. In what is almost a trope, 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" (La Mettrie 1751/1987, I, 67); "the Doctor is the only Philosopher who deserves the praise of his country" (La Mettrie 1751/1987, I, 62) and by the same token, 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" (*ibid.*, 91). 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" (Fouquet 1803, 16, 17; he doesn't mean as Galen or Vesalius might have, that the study of the body's anatomy reveals to us such miracles of design that our metaphysical confidence in the existence of a God should be bolstered!).

Another basic sense in which the materialist understanding of body is not restrictively physicalistic or mechanistic, in the sense of Baglivi or Boerhaave as quoted above, has to do with its reliance on, or at least usage of, entities such as animal spirits, and its emphasis on affects and passions. But this presents us with a problem of genre, for (philosophical) materialism seems to effortlessly move from (medical) materialism to traditional philosophical debate and back again – with body, soul, humours, spirits, passions and the like being 'located' in the interstices of all of these.

Consider anatomy itself. Inasmuch as it is a mechanistic, demystifying kind of project which reduces the body to parts and layers, we might think of it as appealing to the materialist, perhaps in a kind of post-Cartesian vein, which could possibly describe Guillaume Lamy's *Discours anatomiques* (1675) and its usage of anatomy to rebut finalism and teleology in interpreting the structure of the human body. And it has its own radical allure.[11] But anatomy is also a problem for the materialist, who does not want the body to be defined in exclusively structural, positional, static

[11] I do not attempt here to provide an overview of the cultural dimensions of anatomy and early modern embodiment, as discussed in Sawday 1995 (esp. 66f. on the cultural context of anatomy and Vesalius), Mazzio 2005, Mitchell 2007 (with discussion in Salter 2009).

terms. From Bacon and Locke to La Mettrie and Diderot, despite the various differences between such thinkers, we can see a clearly expressed hostility or at least scepticism towards the idea that the anatomical perspective expresses a fundamental 'truth' about the body. In an early manuscript entitled simply "Anatomia," which is diversely attributed to Locke or to the physician Thomas Sydenham, with whom Locke worked in the mid-to-late 1660s, we are told that

> All that Anatomie can do is only to shew us the gross and sensible parts of the body, or the vapid dead juices all which, after the most diligent search, will be noe more able to direct a physician how to cure a disease than how to make a man. . . . The anatomist will hardly be enabled to tell us what changes any particular medicine either makes or receives in the body.[12]

Similarly, Bacon already criticizes anatomy for a lack of attention to what we might call 'function' or 'physiological process', in the *Advancement of Learning*:

> In the inquiry which is made by Anatomy, I find much deficience: for they inquire of the *parts*, and their *substances*, *figures* and *collocations*; but they inquire not of the *diversities* of the *parts*, the *secrecies of the passages*, and the *seats* or *nestlings of the humours*[13]

– even if he also, and more influentially, wrote that "Founding a real model of the world . . . cannot be done without dissecting and anatomising the world."[14]

The "particularities" of certain medicines, the "diversities" of the parts, the "secrecies" of the passages ... It is not so much the 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 "anatomising" it. This is very much the sort of quarrel that Diderot has with more physicalistically inclined materialists like Helvétius (and we could add Hobbes), who think that there is only kind of causes,

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[12] Sydenham/Locke, *Anatomia* (1668) (the text is attributed both to Sydenham and to Locke); Locke's 'version' is Locke ms., National Archives PRO 30/24/72/2 ff. 36v–37r., *cit*. Walmsley 2008, 70. It is also transcribed in Dewhurst 1966, 85-93. For more discussion of this text: Anstey and Burrows 2009.
[13] Bacon, *Advancement of Learning*, II, in Bacon 1857-1874, VI, 246.
[14] Bacon, *Novum Organum*, I, cxxiv, in Bacon 1857-1874, VIII, 156.

physical causes.[15] If Diderot had been active in the 1970s-1980s he doubtless would have been a supporter of self-organization (itself a very chemically oriented theory of life), not in the sense that he does not recognise the importance of selection processes in the evolution of life, but that he is strongly concerned with the production of life, rather than with basic structure. 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.

I mentioned animal spirits (*pneuma psychikon*, *spiritus animalis*) above. These appeared frequently in various medical treatises of the period, notably in the works of Descartes and the Oxford neuroanatomist Thomas Willis, who described them as "the most subtle particles of matter," which flow through the spinal marrow into all nervous fibres; they are "dispersed throughout the body, and as they are distilled in the brain and cerebellum they constitute the Sensitive Soul" (Willis 1683, 23). That materialist embodiment is simultaneously vital and reductive – 'visceral', as it were – appears quite clearly in the case of animal spirits, which also usher in a new kind of determinism, summed up by people like 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).

Early texts of the clandestine tradition display a recurrent usage of animal spirits in a radical, materialist setting and project. For instance, Fontenelle, the long-serving Secretary of the Académie Royale des Sciences, was also a closet radical. He authored an incredibly subversive short work of 'neurological determinism', the *Treatise on the Freedom of the Soul*, which appeared anonymously in 1700 and was only attributed to him sixty years later; it only achieved any notoriety once it was republished in the 1743 clandestine collection *Nouvelles libertés de penser*, although it has recently been discovered that copies were burned in Paris in 1700 on order of the Parliament.

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[15] Diderot, letter to Landois, June 29th 1756, in Diderot 1975-, IX, 258; similar themes are found in an early letter to Voltaire, June 11th 1749, in Diderot 1955-1970, I, 78.

This treatise is relevant to us because it defends the thesis that the 'soul' (for which we can read 'mind'[16]) thinks "according to the dispositions of the brain," which are described in terms of animal spirits (the text appropriates sources including Malebranche and Willis). Conversely, any object which becomes an object of thought, including purely mental objects (*des objets spirituels*), leaves traces in the brain – not a trace of the object itself but of its representation *qua* object of thought. It is a specifically *embodied* form of determinism: Fontenelle insists from the outset that cerebral processes are not to be reduced to the events of the physical world as a whole: we are *neurologically* determined (again with ambiguities: is it more the material dispositions of my brain or the quantity and intensity of animal spirits in my nervous vessels?) rather than physically determined by the states of the universe as a whole.

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* that it should really have been entitled, instead of *Of the Mind*, as it were, "*Of Diversely Organised Matter*, and even better, . . . *Of the Flesh, Particularly the Dirtiest, Most Impure Flesh*."[17] This is not just a hostile projection of 'dirty' hedonism onto an austere metaphysics of matter, a scientism, a theory about mind and cognition. On the contrary, faced with the judgments of various sorts of idealists who felt quite strongly, as Auguste Comte was to express it in the nineteenth century, that 'materialism explains the higher in terms of the lower',[18] thinkers like La Mettrie or Diderot are quite happy to opt for 'base materialism'.

La Mettrie wrote several works either in Epicurean ethics broadly conceived or more specifically on pleasure (Thomson 2000, Wolfe 2009), 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

[16] Fontenelle 1700/1968, sections I-II.
[17] *Nouvelles ecclésiastiques*, 18 November 1758, 188, cited by Salaün 1995, 190.
[18] Comte 1844/1974, § 771).

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" (La Mettrie 1751/1987, II, 286). 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 opera lover is just as happy at the opera 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" (to Damilaville, November 1760, in Diderot 1955-1970, III, 216). 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 course deserved that honour); he deplores the fact that "the hands are despised for their materialism" (*Lettre sur les sourds et muets*, in Diderot 1975-, IV, 15, 54).

Whether or not all of this is commendable, or characteristic of all forms of materialism, it does nevertheless 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 centred on embodied beings; but that any genuine understanding of a doctrine that in its early modern forms (and well until the early 20th 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 (Kaitaro 2001, Wolfe 1999). In the late nineteenth century, Engels

contributed what became for a long time, and in different intellectual quarters, an official story about 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 materialism.[19]

We get this in the theory and the scholarship of the 20th century as well: the idea that materialism is fundamentally *mechanistic materialism*, the reduction of all change to motion, and of all motion to mechanistic motion. We have seen several reasons why this is false, 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 the 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" (Diderot 1765, 221). A variety of kindred spirits such as Buffon, Maupertuis, La Mettrie and Bonnet (who rejected materialism as a metaphysics) concur in *denying* that the body is something that could be *mathematized*. Call this 'vital materialism' (Thomson 2001, Reill 2005, Wolfe and Terada 2008). 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.

3.

[19] Engels 1888/1962, 278 (translation mine); in English in Marx & Engels 1959, 211.

Recall Diderot's method in reading the manuscript of the Dutch scientist Hemsterhuis: "wherever I read *soul* I replace it with *man* or *animal*" (Hemsterhuis / Diderot 1772/1964, 277 [120a]). 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*, that I have mentioned earlier, gives a very personal translation of a passage from *De rerum natura*, which becomes in this version, "the soul is to the body as scent is to incense."[20] To use Lockean language, the soul here becomes a secondary quality of the body. La Mettrie is a little more aggressive and also tilts the strategy towards eliminativism – or is it a reduction without elimination?

> 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 (*L'Homme-Machine*, in La Mettrie 1751/1987, I, 98).

Contemporary terminology has distinguished between reductionism and eliminativism (Churchland 1989), 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 and Galen to Stahl and Swedenborg *does not exist* 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.[21] However, he is not suggesting a weaker thesis, which would be

[20] *L'Âme matérielle*, 174 (cf. *De rerum natura* III, 327-330).

[21] This shift in usage towards *âme* (soul) as a synonym of *esprit* (mind) became increasingly established after La Mettrie's time: many treatises on *les facultés de l'âme* from the later 18th century are treatises of psychology, not reflections on an immaterial, immortal soul (Schneewind 2005).

that soul/mind might be autonomous in some sense but could be 'defined in terms of' bodily processes.

As I will discuss below, 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).

All forms of materialism are deterministic, but in different ways: nothing compels to the materialist to accept that the body, its fluids (including the animal spirits), its *organisation* and the accompanying structure of the passions, is deterministic *just like* a simple machine. Unsurprisingly, a lot depends on how *causes* are understood, and how much weight they are meant to bear in both an ontology and an account of action. Thus it is quite possible, like Helvétius, d'Holbach or Hobbes before them, to hold that there is a fixed, stable and predictable relation between our sensory input, our mental life and consequently our 'temper' and our actions: "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" (D'Holbach 1770/1781, I, i / d'Holbach 1990, 18). D'Holbach's : if someone had a brain organised exactly like Homer's, that person should necessarily produce the *Iliad*, unless we wish to deny that identical causes should produce identical effects.

4.

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 'centre' or 'self' within the system of living parts. To be sure, as the image of the bee-swarm conveys, a number of materialists, who we might call 'vital materialists' (cf. Reill 2005, Thomson 2001), are deeply concerned with providing an account of the organism – of the body as something other or 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 (what we would today call physicalism) then to give a material basis for life and animation. 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 the vitalist physician Ménuret, in his ambitious and programmatic article for the *Encyclopédie* on the "animal economy":

> This idea that the soul is the efficient cause of phenomena because it is the origin (*principe*) of vital motions is not an undeniable truth. It is true that 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 than the fact that they do not hold animals to be living, organized composites. (Ménuret 1765, 364b).

And we saw Ménuret earlier arguing for a more complex, nuanced, almost overlapping relation between 'machine' and 'body' in structural terms than most of our historiographies would generally recognise. Here he is describing the nature of living beings as a type of "composite" which cannot just be explained in terms of either its constituent parts or its motions (as in Hobbes' definition in the second sentence of the introduction to the *Leviathan* that "Life is but a motion of limbs" [Hobbes 1994, 3]). But this "living and organised composite," in other words, what we would call the organism or, in Ménuret's vocabulary, the "animal economy," 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 (typically by people who think that if materialism is not just a crude variant of mechanism, its way of accounting for 'life and mind' must necessarily reduce these to the above sorts of factors)? 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, human thought, and human emotions (Hill 1968, 90).

As we have seen, there is something gravely wrong with this picture. Soul, mind, intentionality needn't be denied in favour of 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. On this view, irritability and other basic physiological properties account for the visible phenomena that we attribute, falsely, to a purely mental agent, a "sailor in the ship" of the body.[22] Another strategy – reductionism of the more mechanistic and less embodied sort – is to say like Hobbes and Hartley, 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"[23]).

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, d'Holbach's confidence notwithstanding). Rather, the corresponding form of reductionism she defends, the *embodied* version, when presented with a phenomenon such as 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 account, employing medical, biological, physiological perspectives on what it is to be that sort of living agent. This is what the materialist physician Abraham Gaultier means when he writes that there is no soul separate from the body, because the soul is simply the body and its workings (Gaultier 1714/1993, 142, 170). It is also the kind of

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[22] The image 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 that Descartes in the Sixth Meditation 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" (AT IX, 64 / CSM II, 56).

[23] d'Holbach 1770/1781, I, xi / d'Holbach 1990, 220.

reductionism at work in Diderot's assertion, not that there is no soul, but rather that "I challenge [you] to explain anything without the body" (*Éléments de physiologie*, in Diderot 1994, 1282).

If materialism is not merely mechanistic (or even mechanistic at all, or at least is mechanistic in an expanded, fluid sense far removed from Engels' definition), but instead seeks to articulate an *embodied* account of mental life, the will, action, and so on, 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. Diderot himself describes the brain as both a book – a source on which information is imprinted, like a mass of sensing, living wax – but also a reader, and ultimately a book "which reads itself" (Diderot 1975-, XVII, 237, 470). Conversely, if our nervous system produces such states, it gives them a kind of reality.

Granted, some materialists (Hobbes, d'Holbach, Hartley) think that mental life is itself simply a species of motion. Others, speaking about action, motivation and desire rather than about mechanical versus organismic properties of entities, 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 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"[24] does not have to mean that materialist bodies are just piles of flesh, mere "aggregates" in the language of the period. After all, living bodies do possess a variety of senses of their inner life, including what Patricia Churchland has elegantly called "awareness of visceral circumstance" (Churchland 1988, 282). Leibniz himself entertains this possibility in the *New Essays Concerning Human Understanding* (1704), suggesting that "something does happen in the soul in response to . . . the internal motions of the viscerae" (II.i.15), perhaps in response to Descartes' remarks in the Sixth *Meditation* on the fact that I have a 'personal' experience of bodily processes

[24] Merleau-Ponty 1963, 208-209 (trans. modified).

including "twitching in the stomach" (AT IX, 60) – of course Leibniz quickly adds that the soul is unaware of such motion.

That we can have awareness of "visceral circumstance" does not mean that the materialist sense of embodiment is restricted to the spirits, the humours and the guts. It simply implies that we have "a route of epistemological access" to our own body, which others lack, and thereby also to our mind (Armstrong & Malcolm 1984, 112). D'Holbach seems actually quite sensitive to this: "I can only be aware or assured of my own existence by the motions I experience in myself" (D'Holbach 1772/1971, § 41, 30); "to be what we call intelligent, one must have ideas, thoughts, volitions ; one must have organs; to have organs, one must have a body" (*ibid*., § 46, 36-37). But such routes or pathways of access to 'one's self' are not themselves foundational for the materialist, and must be *explained*.

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. I hope it is clear by now 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" (Duhem 1902/1985, 50). Additionally, "That the mind possesses such a corporeal nature need not be feared as a blow to our self-esteem" (La Mettrie 1747, 111)

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