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VITALISTIC APPROACHES TO LIFE IN EARLY MODERN ENGLAND

Abstract: *Vitalism has been given different definitions and diverse figures have been labelled as vitalists throughout the history of ideas. Concentrating on the seventeenth century, we find that scholars identify as vitalists authors who endorse notions that are in diametrical opposition with each other. I briefly present the ideas of dualist vitalists (Henry More, Ralph Cudworth and Nehemiah Grew) and monist vitalists (Francis Glisson, Margaret Cavendish and Anne Conway) and the philosophical and theological considerations informing their thought. In all these varied forms of vitalism the identifiable common motives are the essential irreducibility of life (regarded as a property of either an immaterial spirit or matter itself) and the universality of life (extending well beyond the "organic" realm of nature, incorporating the "inorganic").*

Keywords: *Anne Conway; Francis Glisson; Henry More; Margaret Cavendish; Cambridge Platonism; biology; scientific revolution; vitalism*

Vitalistické přístupy k životu v raně novověké Anglii

Abstrakt: *V dějinách idejí se vitalismu dostalo různých definic a různé postavy byly označeny za vitalisty. Když se soustředíme na 17. století, zjistíme, že badatelé identifikovali jako vitalisty autory, kteří zastávají názory, jež jsou v diametrálním protikladu. Stručně představím názory dualistických vitalistů (Henry More, Ralph Cudworth a Nehemiah Grew) a monistických vitalistů (Francis Glisson, Margaret Cavendishová, Anne Conwayová), a filosofické a teologické uvažování, které formovalo jejich myšelní. Ve všech těchto různých podobách vitalismu se nacházejí identifikovatelné společné motivy: bytostná neredukovatelnost života (považovaná za vlastnost buď nehmotného ducha nebo samotného hmoty) a univerzalita života (sahající daleko za „organickou" oblast přírody až „anorganické").*

Klíčová slova: *Anne Conway; Francis Glisson; Henry More; Margaret Cavendish; cambridgeský platonismus; biologie; vědecká revoluce; vitalismus*

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The sciences of life and the scientific revolution

Few scholars would argue today that there was in the early modern era a revolution of the life sciences comparable to that of the physical sciences. Regarding biology, most accounts of the scientific revolution mention a few isolated discoveries, such as William Harvey's discovery of the circulation.[1] The lack of a thoroughgoing conceptual change (one of the three aspects of the process of the revolution, besides methodological and institutional change) is especially conspicuous. The role of the mechanical philosophy, the fundamental element of the revolution in the physical sciences, had let its impact felt early on, but its significance is nevertheless rather ambiguous. As Richard Westfall noticed, even though mechanical philosophy invaded the life sciences in the form of iatromechaninsm, it proved to be irrelevant: it did not contribute to the better understanding of vital phenomena, neither did it hinder observations and experiments that had been conducted anyway.[2] The most remarkable achievements, those of Fernel, Vesalius, Harvey etc. were performed within the old Aristotelian and Hippocratic-Galenic framework.[3]

As Justin H. Smith pointed out, that biology as a discrete domain of science was non-existent in the seventeenth century and that no revolution actually took place, does not mean that natural philosophers were not inter-

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[1] See for example: John HENRY, *The Scientific Revolution and the Origins of Modern Science*. London: Palgrave Macmillan 2008, p. 2. Mirko Grmek argued that a real (and a first) biological revolution took place in the seventeenth century, which he sees as the joint advancement of experiments, inductive methods and mechanical explanations in the period. Although with hindsight we can identify these developments as prerequisite for the later progress of the life sciences, it remains unclear in what sense did they revolutionize the science of the living in the seventeenth century. Mirko D. GRMEK, *La première Revolution Biologique: Réflexions sur la Physiologie et la Médecine du XVIII Siècle*. Paris: Editions Payot 1990. For a critique of Grmek's thesis see the review by Andrew PYLE, "Book Review: *La première Revolution Biologique: Réflexions sur la Physiologie et la Médecine du XVIII Siècle*." *British Journal for the History of Science*, vol. 24, 1991, no. 2, pp. 255–257.

[2] Richard S. WESTFALL, *The Construction of Modern Sciences*. New York: Wiley 1971, p. 104.

[3] Phillip R. SLOAN, "Descartes, the Sceptics, and the Rejection of Vitalism in Seventeenth-Century Physiology." *Studies in the History and Philosophy of Science*, vol. 8, 1977, no. 1, p. 2 (1–28).

ested in the living world.[4] On the contrary, huge efforts were concentrated on exploring the nature of life and the boundaries between the animate and the inanimate world. Such speculations and explorations were conducted in terms of metaphysics, natural philosophy, medicine (broadly conceived including anatomy, physiology, therapeutics and theoretical medicine), and, increasingly, chemistry. These domains, in so far as the phenomena of life were concerned, constituted the sciences of life.

Georges Canguilhem pointed at one of the most conspicuous differences between the patterns of the history of the physical sciences and the life sciences. As he observed, the history of biology has been displaying a dialectic movement between vitalism, considered to be predominant before the scientific revolution, and mechanism.[5] Vitalism, this allegedly outmoded and transcended philosophy of biology shows a remarkable endurance and vitality so much so that it has proven to be able to perform several resurgences, and to provoke attacks and refutations by mainstream reductionist science as late as the twentieth century. In contrast, science got rid of Aristotelian physics or phlogiston theory for good and no sensible scientist attempted their resurrection later. Thus vitalism, having been challenged in its Aristotelian form, safely survived the intellectual turmoil of the scientific revolution and for certain periods it could even take the upper hand over mechanism.

In this paper I focus on the second half of the seventeenth century when mechanical philosophy was on its way to become the mainstream philosophical discourse and started to invade even physiology and medicine.[6] I investigate the various philosophical (that is, chiefly metaphysical or distinctively speculative natural philosophical) approaches to life. Although it is hard or even impossible to distinguish between strictly philosophical and scientific approaches to life in this period, given the confines of the present study, I restrict my focus on the views of philosophers (or, as in the case of Francis Glisson and Nehemiah Grew, the speculative writings of physicians or natural historians) and leave out the rich and influential traditions of medical and alchemical vitalism, which were in fact, as it should

[4] Justin E. H. SMITH, *Divine Machines: Leibniz and the Sciences of Life*. Princeton – Oxford: Princeton University Press 2011, pp. 1*ff*. He also argues for the justifiability of speaking about biology in this era despite its obvious anachronism, an opinion with which I concur.

[5] Georges CANGUILHEM, "Aspects of Vitalism." In: *The Knowledge of Life*. New York: Fordham University Press 2008, pp. 59–74.

[6] On the rise of mechanism in the life sciences, see Theodore BROWN, *The Mechanical Philosophy and the "Animal Oeconomy"*. New York: Arno Press 1981.

be kept in mind throughout, closely bound up with the development of the philosophical ideas presently under discussion. Without intending to give a comprehensive and exhaustive account even of the thus artificially isolated philosophical approaches themselves, which would alone require at least an entire monograph, I set out only to identify major patterns and strategies that were employed to deal with the question of life without falling back upon Aristotelian notions and, at the same time, to avoid the scientific weaknesses and theological dangers posed by Cartesian and Hobbesian mechanism.

The meanings of vitalism

Though the notion of mechanism or mechanical philosophy is not free from ambiguities and complications, at least at this level of generality it seems to be less problematic compared with vitalism.[7] In the early modern period a number of natural philosophers identified themselves as mechanical philosophers and on the level of definition they were more or less in agreement as to what mechanical natural philosophy meant. According to Robert Boyle mechanical philosophy explains natural phenomena in terms of the "mechanical affections of matter" by which he means size, shape, motion (and rest) of the material particles.[8]

The case of vitalism is more complicated as the term did not exist in the period under scrutiny.[9] To vitalism various meanings have been attached, sometimes contradictory ones. Now I don't even attempt to enumerate them, nor do I come up with a solution to this semantic conundrum. So long as one precisely defines what one means by the term and uses it consistently,

[7] For the problematic nature of mechanism in modern life science, see for example Garland F. ALLEN, "Mechanism, Vitalism and Organicism in Late Nineteenth and Twentieth-Century Biology: The Importance of Historical Context." *Studies in History and Philosophy of Biological and Biomedical Sciences*, vol. 36, 2005, no. 2, pp. 261–283.

[8] Robert BOYLE, "An Introduction to the History of Particular Qualities (1671)." In: STEWART, M. A. (ed.), *Selected Philosophical Papers of Robert Boyle.* Indianapolis – Cambridge: Hackett Publishing Company 1991, p. 105. To these catholic affections of matter Boyle adds seven "not altogether yet almost as catholic" principles (such as position, order and texture) that yield eleven principles "so fruitful that from their various associations may result a much vaster multitude of phenomena" and qualities observable in the natural world. *Ibid*., p. 107.

[9] The term "vitalism" was coined by Charles-Louis Dumas at the beginning of the nineteenth century. See Peter Hanns REILL, "The Construction of the Social Sciences in Late Eighteenth and Early Nineteenth Century Germany." In: WITTROCK, B. – HEILBRON, J. – MAGNUSSON, L. (eds.), *The Rise of the Social Sciences and the Formation of Modernity.* Dordrecht: Springer 1998, p. 110, 134, note 11 (107–140).

discussion remains possible even between scholars employing different definitions. However, as Lester King warned, labels, though useful, can be tyrannical if they reify into strict disjunctive oppositions where none had existed.[10] Labelling by the term "vitalism" such diverse figures as Plato, Aristotle, Hippocrates, Jan Baptista van Helmont, Thomas Willis, Georg Ernst Stahl, Paul-Joseph Barthez and Hans Driesch, as Canguilhem does, indicates that the term actually hides more than it reveals. However, beyond the often contested categorization of particular figures, scholars usually agree that vitalists have in common that they believe that life cannot be understand in terms of, or more precisely, cannot be reduced to, properties of matter. Accordingly, Canguilhem says that "it is nonetheless a fact that, in general and as a consequence of the signification it acquired in the eighteenth century, the term vitalism is appropriate for any biology careful to maintain its independence from the annexationist ambitions of the sciences of matter."[11]

This independence from mere matter usually manifests itself in the presupposition of the existence of "something other" than matter, a vital principle, an animating substance, an entelechy. Thus, vitalism is often understood as a dualistic philosophy. In later history self-conscious vitalists such as Barthez and Driesch, both of whom posited an autonomous vital agent responsible for the specific characteristics of living beings, substantiate this claim. Similarly, Henry More the seventeenth century Cambridge Platonist philosopher can be designated as vitalist on account of his doctrine of the spirit of nature, an immaterial agent governing material nature.[12]

However, one does not have to dig too deeply in the relevant secondary literature to find a diagonally opposite interpretation. Carolyn Merchant identifies the contemporary critics of early (Cartesian and Hobbesian) mechanical philosophy as belonging to two major camps: the Cambridge Platonists, who were dualists (though their dualism differed significantly from Cartesianism), and the vitalists. In contrast to the dualism of Cambridge Platonism, vitalists "affirmed the life of all things through a reduction of the

[10] Lester KING, *The Philosophy of Medicine: The Eighteenth Century*. Cambridge, MA – London: Harvard University Press 1978, p. 95. King speaks here of iatromechanism and iatrochemistry.
[11] CANGUILHEM, "Aspects of Vitalism," p. 60.
[12] Henry More is called vitalist by, among others, Alexander Jacob in his edition of *More's Immortality of the Soul* (Alexander JACOB, *More's Immortality of the Soul*. Dordrecht: Martinus Nijhoff Publishers 1987). More and Nehemiah Grew are associated with vitalism by Brian Garrett, see Brian GARRETT, "Vitalism and Teleology in the Natural Philosophy of Nehemiah Grew (1641–1712)." *British Journal for the History of Science*, vol. 36, 2003, no. 1, pp. 61–83.

Cartesian dualism to the monistic unity of matter and spirit."[13] According to Merchant, the proponents of vitalism include Francis Glisson, Francis Mercury van Helmont, Anne Conway and Gottfried Wilhelm Leibniz. Other scholars studying seventeenth century thought also identify vitalism with a monistic materialism. Stephen M. Fallon defines vitalism as "the belief that life is a property traceable to matter itself rather than to either the motion of complex organizations of matter or an immaterial soul,"[14] and he includes Francis Bacon, William Harvey, Anne Conway and John Milton in this current of thought. Following both Merchant and Fallon, John Rogers also highlights the monistic aspect of vitalism, that conceives of material substance as a "unity of matter and spirit" and "a self-active entity."[15] In Rogers's view the "premier vitalist theorists" are Jan Baptista van Helmont (father of Francis Mercury), William Harvey and Francis Glisson but he also includes (actually his main concern are) John Milton, the Digger leader Gerrard Winstanley and Margaret Cavendish. Thus, in contrast to Canguilhem's characterization of vitalism in the eighteenth century and beyond, at least some scholars see seventeenth century vitalism not as attempting to demarcate itself from the sciences of matter but as a science of matter itself, albeit a science of matter very different from mechanical natural philosophy.

Thus, under the rubric of vitalism we find thinkers who not only differed here and there but who espoused diametrically opposite metaphysical stances. The vitalism of Glisson, Conway and Cavendish is monistic, according to them matter as such is active and is endowed with vital properties. The Cambridge Platonists and their followers, on the other hand, are dualists. According to them, matter is inert and passive, vital functions and activity are attributable to immaterial spiritual beings. Interestingly, they concur with strict mechanism in that, properly speaking, matter cannot be said to be alive. This explains Henry More's qualified enthusiasm for Cartesian philosophy which monistic vitalist thinkers never had the chance to elicit in him, even though nowadays both Cambridge Platonists and monist vitalists are often subsumed under the heading "vitalism" together.[16] On the

[13] Carolyn MERCHANT, "The Vitalism of Anne Conway: Its Impact on Leibniz's Concept of the Monad." *Journal of the History of Philosophy*, vol. 17, 1979, no. 3, p. 255 (255–269).
[14] Stephen M. FALLON, *Milton among the Philosophers*. Ithaca – London: Cornell University Press 1991, p. 111.
[15] John ROGERS, *The Matter of Revolution: Science, Poetry, and Politics in the Age of Milton*. Ithaca – London: Cornell University Press 1996. p. 10.
[16] Discussing Ralph Cudworth's *True Intellectual System*, John Sellars also points out that from the Cartesian Cudworth's perspective, mechanical corpuscularian materialism has at

other hand, in the eye of More and other dualists, Cartesian mechanism wrongfully perverted, or Hobbesian mechanism as it is, can pose a similar threat to monistic vitalism. From their perspective, the suggestion that matter (together with the laws of nature governing it) is self-sufficient and capable of bringing about natural order (which the Cambridge Platonists flatly reject) is obviously atheistic. The autonomy of matter undermines the belief in God and divine providence and destroys the moral order. Perhaps there is no more powerful contemporary articulation of the fears of the Cambridge Platonists and other critics of theories involving self-organizing autonomous matter than the words with which Satan justifies his rebellion in Milton's *Paradise Lost*. Satan rejects that he was created by God and that he has a concomitant obligation to obey his creator. Instead, he claims that he and his fellow rebels emerged from unformed matter by virtue of their own power inherent in them as material beings: "We know no time when we were not as now; / Know none before us, self-begot, self-rais'd / By our own quick'ning pow'r [...]".[17] That in the philosopher-poet's imagination the deadliest rebellion in history was justified by the doctrine of self-organizing matter (leaving aside for now the moot question of Milton's own sympathies) indicates the theological and moral import of this doctrine.

Dualistic vitalisms

Whereas the assertion that bodies *qua* bodies cannot be alive meant for the Cartesians the elimination of the living as a natural kind,[18] it prompted the Cambridge Platonists and their followers to introduce a universal vital substance that animates the world. One of the most eloquent promoters of the notion of the Spirit of Nature in the second half of the seventeenth century was the Cambridge Platonist philosopher and theologian Henry More (1614–1687). Having abandoned his youthful endorsement of a kind of monistic philosophy in the 1640s and early 1650s, in his mature years he posited an intermediate agent between God and the material world, which he called the Spirit of Nature and defined thus:

least partial truth in it as a component of an incorporealist, theologically sound system. John SELLARS, "Is God a Mindless Vegetable? Cudworth on Stoic Theology." *Intellectual History Review*, vol. 21, 2011, no. 2, pp. 121–133.

[17] John MILTON, *Paradise Lost*, Book V, 859–861.

[18] Dennis DES CHENE, *Spirits and Clocks: Machine and Organism in Descartes.* Ithaca – London: Cornell University Press 2001, p. 2.

> *A substance incorporeal, but without Sense and Animadversion, pervading the whole Matter of the Universe, and exercising a Plastical power therein, according to the sundry predispositions and occasions in the parts it works upon, raising such Phaenomena in the World, by directing the parts of the Matter and their Motion, as cannot be resolved into mere Mechanical powers.*[19]

This spirit, as spiritual substances (including animal and human souls) in general, is penetrable and indiscerpible (indivisible), that it, its essence is diametrically opposed to that of material substance which is impenetrable and discerpible. Thus, in sharp contrast to Cartesian metaphysics, More held that *both* matter and spirit are extended.[20] More importantly to our present concern, he attributes life and movement to spirit alone while he categorically deprives matter of them. Matter is defined by him as a substance "*of itself altogether destitute of all Perception, Life, and Motion*."[21] These properties belong to spirit, which has "immediate Properties whereby it is understood to have *Life* intrinsically in *itself*, and the faculty of *moving*; which in some sence is true in all Spirits whatsoever, forasmuch as *Life* is either *Vegetative, Sensitive,* or *Intellectual*."[22] As Jasper Reid has pointed out, "from More's point of view, to have the power to animate a body was just *what it was to be a spirit*. Hence, there was no more need for More to explain how a soul could act on matter than there was for Descartes to explain how a soul could think."[23] In other words, the phenomenon of life, being an inherent irreducible property of spirit, does not require further explication.[24]

[19] Henry MORE, *The Immortality of the Soul*. Dordrecht: Martinus Nijhoff Publishers 1987 [1659], Book III. Chapter 12, §1, p. 254 (italics in the original).

[20] More called nullibism the view according to which spiritual substances are not extended, thus they are nowhere in space, and he exerted considerable effort to refute it. See More's *The easie, true, and genuine Notion, and a Consistent Explication of the Nature of a Spirit,* printed in Joseph GLANVIL, *Saducismus Triumphatus*. London: James Collins 1681, 99–180. He readily endorsed the consequence that God is also extended, although he insisted that God, just like spirits in general, is strictly immaterial. Yet on account of his insistence on the spirits' extension and also its "spissitude" (its ability to dilate and contract), there are traces of a paradoxical *quasi*-materialism in More's writings, pointed out by John Henry; see John HENRY, "A Cambridge Platonist's Materialism: Henry More and the Concept of Soul." *Journal of the Warburg and Courtauld Institute*, vol. 49, 1986, pp. 172–195.

[21] MORE, *The easie, true, and genuine Notion, and a Consistent Explication of the Nature of a Spirit,* p. 140.

[22] *Ibid*., p. 144 (italics in the original).

[23] Jasper REID, *The Metaphysics of Henry More.* Dordrecht: Springer 2012, pp. 239–240.

[24] More at first introduced a host of different, individual spiritual substances that animate plants, animals, human beings and also intervene in the physical process where mechanical operations prove insufficient. Later, with the introduction of a single all-pervading spiritual substance he

What called for explanation, as it is usual in dualist systems, was the interaction between the corporeal and the material substance. At this point More introduced the notion of vital congruity:

> It is plain therefore, that this *Union of the Soul with Matter* does not arise from any such gross *Mechanical* way, as when two Bodies stick one in another by reason of any toughness and viscosity, or streight commissure of parts; but from a *congruity* of another nature, which I know not better how to term then *Vital:* which *Vital Congruity* is chiefly in the *Soul* it self, it being the noblest Principle of Life; but is also in the *Matter,* and is there nothing but such modification thereof as fits the *Plastick* part of the Soul, and tempts out that Faculty into act. Not that there is any *Life* in the *Matter* with which this in the *Soul* should sympathize and unite; but it is termed *Vital* because it makes the *Matter* a *congruous* Subject for the Soul to reside in, and exercise the functions of life. For that which has no *life* it self, may tie to it that which has.[25]

Thus, according to More, soul is able to prepare matter suitable to its own residence therein. As it might be suspected (and we shall see it in the example of Anne Conway), monistic vitalists found this account of the interaction between two substances wanting, to say the least.

During his intellectual development, More became increasingly restrictive as to the scope of mechanical explanations of physical phenomena. He pointed out many times that a number of physical phenomena are inexplicable in mechanistic terms and by the late 1660s he came to the conclusion that "there is no purely Mechanicall Phenomenon in the whole Universe."[26] In his correspondence with Henry Hyrne, he made clear what he meant by "pure mechanism":

> supposing so much motion in the World as there is, the mere rumblement of y^{e} matter with this motion will generate all y^{e} corporeall Phaenomena in y^{e} world," stating that this view tends to "Atheisme" as it might imply that "that y^{e} world generated it self.[27]

reduced the number of entities while at the same time extended the sphere of spiritual agency to the whole of nature. The Spirit of Nature by itself accounted for plant growth and also many physical processes, while only animal and human souls retained their individuality.

[25] MORE, *The Immortality of the Soul,* Book 2, Chapter 14, §§8–9, p. 158 (italics in the original).

[26] Henry MORE, *Divine Dialogues*, vol. 1, 1668, as cited in Alan GABBEY, "Henry More and the Limits of Mechanism." In: HUTTON, S. (ed.), *Henry More (1614–1687): Tercentenary Studies*. Dordrecht: Kluwer 1990, p. 25 (18–35).

[27] As cited in GABBEY, "Henry More and the Limits to Mechanism," pp. 26–27. Here More identifies himself with the view he calls "mixt Mechanicall Philosophy."

Yet as we shall see, according to More hylozoic or monistic vitalism poses as great (if not even greater) threat to true religion as strict mechanism. As he put it referring to Francis Glisson (to whom I shall return below), „for that Hypothesis, if it were true, were as safe, if not a safer Refuge for Atheists, then mere Mechanick Philosophie is."[28] For More only the continual supervision of an all-pervading, animating but unconscious spiritual substance, this blind executioner of the divine ordinances, can guarantee the maintenance of order and harmony in the universe that, by virtue of this universal spiritual substance, itself obtains the character of a living being, like "one large *Zoophyton* or a *Plant-Animal*."[29]

In the natural philosophy of an eminent follower of the Cambridge Platonists, the botanist Nehemiah Grew (1641–1712) the idea that matter cannot be subject of life is even more emphatic. Grew says, "we must allow the being of a Substantial Principle, distinct from Body, as the proper and immediate Subject of Life."[30] As "Body cannot be vital," the existence of a vital substance, distinct from the corporeal substance, is necessary. Grew writes, "without a Substantial Principle, as the proper Subject of Life, distinct from Body: There could be no Living, much less any Sensible, Thinking, or Reasonable Thing."[31] He demonstrates this claim by refuting one by one each item on a supposedly exhaustive list containing the attempts to derive life directly from matter. He suggests four possibilities for how life could theoretically be attributed to the corporeal substance: matter is either regarded as "Subtilized, or as Organized, or as moved, or as Endowed with Life."[32]

Grew ascribes the view that animal life consists in subtle, ethereal matter to Descartes and Thomas Willis.[33] Grew argues that by merely increasing

[28] Henry MORE, *Annotations upon the Discourse of Truth*. In: Joseph GLANVIL – George RUST, *Two Choice and Useful Treatises*. London: James Collins and Sam Lowndes 1682, p. 192–193, as cited in HENRY, "Medicine and Pneumatology," 38–39.
[29] MORE, *Annotations upon the Discourse of Truth*, p. 244, as cited in REID, *The Metaphysics of Henry More*, p. 343.
[30] Nehemiah GREW, *Cosmologia Sacra, or a Discourse of the Universe as it is the Creature and Kingdom of God*. London: W. Rogers, S. Smith and B. Walford 1701, p. 34.
[31] *Ibid*., 32.
[32] *Ibid*.
[33] It is interesting to note that Willis, considered a vitalist by Canguilhem, is associated to Descartes, the arch-mechanist by a near-contemporary of both. John Ray, the natural historian and physico-theologist, himself a supporter of Cudworth's plastick nature, also lumps Willis together with Descartes and Gassendi as those who taught that animals are "mere machines." John RAY, *The Wisdom of God Manifested in the Works of the Creation*. London: William Innys 1714, p. 54. (The book was first published in 1692.)

the subtlety of material substance life cannot emerge, because subtilization is nothing more than division, and the division of dead matter will always result in dead matter. Moreover, subtlety allows for degrees which would entail that life is also a matter of degree, and we should suppose that drops of mist or a heap of sand have more or less life in them. Similar line of reasoning applies for organization and movement: being differently sized, figured, mixed, or moved cannot bring about the qualitatively different property of life, and these views would also imply that every corporeal thing, in so far as they are figured or moved etc., should have more or less life in them, which is obviously absurd.[34] Neither can matter be productive or receptive of life. It cannot be productive of life because it even cannot be productive of motion (which Grew demonstrated in an earlier chapter). Body *can* be receptive of motion (from God), but not of life, otherwise every atom could be living in the same manner as every atom can be moving. Grew thus concludes that

> [t]o avoid which Absurdity, we must allow the being of a Substantial Principle, distinct from Body, as the proper and immediate Subject of Life. Or, that as Body, is the proper and immediate Subject; of any Species of Motion: So there ought to be such a Substantial Principle, as may be the proper and immediate Subject, not of one only, but of any Species of Life. What therefore Motion is, to all Bodies; that Life is, *suo modo,* to all the Species of Vital Substance.[35]

Grew, again, felt that life is an essentially irreducible property of this substance so that it cannot (and need not) be further analyzed.

According to Ralph Cudworth (1617–1688), the most prominent Cambridge Platonist besides More, atheists are always materialists (or corporealist, as he calls them), whereas incorporealists (those who accept the existence of incorporeal substances) are never atheists.[36] Thus, one who intends to refute atheism, and this was Cudworth's objective in his *True Intellectual System of the Universe* (1678), has to refute materialism and demonstrate the existence of incorporeal substances. Cudworth first identifies four types of atheistic philosophies, all of which are rooted in antiquity: Anaximandrian or hylopathic, Democritical or atomostic, Stoic or cosmoplastic, and Stratonian ot hylozoic.[37] The first two types hold that matter is "dead and

[34] *Ibid*., p. 33.
[35] *Ibid*., p. 34.
[36] Cudworth allows that corporealists are not necessarily atheists but he deems their conception of a corporeal and anthropomorphic deity childish. Ralph CUDWORTH, *The True Intellectual System of the Universe*. Vol. 1. London: Thomas Tegg 1845, Chapter 3, § 30, p. 202.
[37] *Ibid*., pp. 199–200.

stupid," the third type regards matter "plastic" but "senseless," while hylozoism "attributes to all matter, as such, a certain living and energetic nature, but devoid of animality, sense and consciousness."[38] Although this life that hlyozoists wish to attribute to matter is only "natural" and "plastic," matter is claimed to able to organize itself into higher levels of complexity and thus to perform higher functions (such as sense and cognition):

> All parts of matter being supposed able to form themselves artificially and methodically (though without any deliberation or attentive consideration) to the greatest advantage of their present respective capabilities, and therefore also sometimes by organization to improve themselves further into sense and self-enjoyment in all animals, as also to universal reason and reflexive knowledge in men; it is plain, that there is no necessity at all left, either of any incorporeal soul in men to make them rational, or of any Deity in the whole universe to solve the regularity thereof.[39]

In the Preface Cudworth remarks that hylozoism, originally an ancient doctrine, had been lying dormant until recently, when it was "awakened" and "revived" by some

> who were so sagacious as plainly to perceive that the atomic form could never do their business, nor prove defensible, and therefore to carry on this attempt to carry on this cause of atheism, in quite a different way, by the life and perception of matter, and also that this, in all probability, would ere long publicly appear upon the stage, though not barefaced, but in disguise.[40]

This is probably a reference to Francis Glisson's Latin treatise *On the Energetic Nature of Substance* published in 1672.[41]

Monistic vitalisms

The Cambridge physician Francis Glisson's (1597–1677) hylozoic materialism, also called energetic corpuscularianism, conceives of matter as a substance endowed with energy, perception and appetite.[42] Matter is not an

[38] *Ibid*., p. 200.
[39] *Ibid*., p. 144.
[40] *Ibid*., p. xl.
[41] Francis GLISSON, *De Natura Substantiae Energetica*. London: E. Flesher 1672.
[42] For the subtleties of Glisson's theory, see Guido GIGLIONI, "Francis Glisson's Notion of *Confoederatio Naturae* in the Context of Hylozoistic Corpuscularianism." *Revue d'histoire des sciences*, vol. 55, 2002, no. 2, pp. 239–262.

aggregate of individual, active corpuscules or *minima naturalia*, but on the contrary, the disposition of the particles (which are to be conceived as clots of energy) are derivative of the general energetic nature of the material substance, and even the identity of the minima depends on their broader material context.[43] Natural things as individuals come into existence by a process of self-confederation during which particles perceived as immanent are incorporated while the rest is expelled. Self-confederation is an internally driven, perceptive and constitutive process. Matter can be organized into different levels of complexity, but as Guido Giglioni points out, although Glisson makes a distinction between "inorganic" (*similaris*) and "organized" (*dissimilaris*) matter, yet "natural perception – the source of all life and irritability in the body – is intrinsic in matter *qua* matter independently of its level of organization."[44] Glisson's abstruse theory of energetic substance owes much to Tommaso Campanella and Jan Baptista van Helmont and is a late heir of Renaissance forms of pansensism.[45] Yet Glisson's theory was also inspired by empirical findings and physiological research. In fact, Glisson is credited with the discovery of living tissues' irritability, their capacity to respond to external stimuli without the mediation of the nervous system.[46] As he saw it, his natural philosophy could shed more light on his medical and physiological views, so much so that that he postponed the publication of his treatise on the motion of the intestines including his explication of irritability, until he devised his unique and original natural philosophy.

Although Glisson's idiosyncratic theory was not easily accessible even to the contemporaries due to its unusual ideas and highly technical language, it

[43] As Giglioni explains, "the smallest corpuscles resulting from a division could not be the same in a different division of the same compound: this is because *the minima naturalia* are not atoms, that is, discrete entities which are definite once and for all, nor are they particles which are obtained by dividing a compound into its possible smallest terms from the outside. Rather, they are so to speak temporary clots of vital energy, which shun further divisions since they perceive this as a danger for their identity." *Ibid*., p. 252.

[44] See Guido GIGLIONI, "Whatever Happened to Francis Glisson?" Albrecht Haller and the Fate of Eighteenth-Century Irritability." *Science in Context*, vol. 21, 2008, no. 4, pp. 1–29.

[45] GIGLIONI, "Francis Glisson's Notion of *Confoederatio Naturae*," p. 241.

[46] See GIGLIONI, "Whatever Happened to Francis Glisson?" and John HENRY, "Medicine and Pneumatology: Richard Baxter, Henry More, and Francis Glisson's *Treatise on the Energetic Nature of Substance*." *Medical History*, vol. 31, 1987, no. 1, pp. 15–40. On page 22, Henry refers to Glisson's philosophy as materialistic vitalism. Walter Pagel traces Glisson's notion of irritability to Jan Baptista van Helmont and William Harvey, the latter of whom attributed to blood an intrinsic tendency to movement. See Walter PAGEL, *Joan Baptista Van Helmont: Reformer of Science and Medicine*. Cambridge – New York: Cambridge University Press 1982, pp. 120–123.

found some sympathizers even outside the medical community. The Puritan theologian Richard Baxter (1615–1691) wrote commendably on Glisson's theory of the energetic nature of substance in the early 1680s, inducing Henry More's criticism, who in 1679 already had written a refutation of the physician's philosophy.[47] The details of the Baxter–More debate need not concern us here. Suffice it to say that the fundamental disagreement between the two men was of theological nature. Baxter endorsed a voluntaristic theology with an all-powerful God who was certainly able to attach vital properties to matter at will. As Baxter put it,

> I confess I am too dull to be sure that God cannot endue matter itself with the formal virtue of Perception: That you say the Cartesians hold the contrary, and that your writings prove it, certifieth me not. [...] That Almighty God cannot make perceptive living Matter, and that by informing it without Mixture, I cannot prove, or I think you: Where is the Contradiction that makes it impossible?[48]

On the other hand, More, the life-long defender of rational theology tried to secure the neat conceptual and metaphysical distinction between matter and spirit with all his intellectual prowess, in order to refute materialism, which he, like his colleague Cudworth, regarded as the chief source of atheism.[49] To his chagrin, not all of his contemporaries did share his concerns, and the voluntarist theological stance enabled even grosser speculations. What if matter is not only capable of life but also of thought? The famous thought experiment was proposed in the fourth book of John Locke's *Essay Concerning Human Understanding*.[50] But even before that, a similar (but even bolder) notion had been put forward as one of the cornerstones of Margaret Cavendish's natural philosophy.

Margaret Cavendish (1623–1673), the eccentric wife of William Cavendish, the Duke of Newcastle, was one of the most thorough-going materialists of the seventeenth-century, surpassed perhaps only by Thomas Hobbes, who came to the conclusion that even God is corporeal. Cavendish maintains

[47] More's treatise against Glisson and Spinoza was published in 1679, titled *Ad V.C. epistola altera* in *Opera Omnia*, his collected works in Latin translation. The treatise and the debate with Baxter are discussed in HENRY, "Medicine and Pneumatology."
[48] As cited in HENRY, "Medicine and Pneumatology," p. 36.
[49] As More famously declared in the last sentence of his *An Antidote Against Atheism*: "*No Spirit, no God*" (Henry MORE, *An Antidote Against Atheism*. 2nd edition. London: J. Flesher 1655, p. 278).
[50] On Locke's idea and its subsequent history, see John W. YOLTON, *Thinking Matter: Materialism in Eighteenth-Century Britain*. Minneapolis: University of Minnesota Press 1983.

that God is immaterial and omnipotent but he is infinitely beyond nature. His existence is known by all creatures but his attributes are incomprehensible to them.[51] Apart from God, everything is material.

In her first published writing, *Poems and Fancies* (1653) partly written in verse form, Cavendish expounded an atomist natural philosophy. Atoms moving in space make up the world by themselves:

> Small *Atomes* of themselves a *World* may make,
> As being subtle, and of every shape;
> And as they dance about, they places finde,
> Such *Formes* as best agree, make every kind.[52]

But not only physical objects, but also vital and mental phenomena are produced by atoms:

> Thus *Life* and *Death,* and young and old,
> Are, as the several *Atomes* hold.
> So wit, and *Understanding* in the *Braine*,
> Are as the several *Atomes* reigne:
> And *Dispositions* good, or ill,
> Are as the several *Atomes* still.
> And every *Passion* which doth rise
> Is as the several *Atomes* lies [*sic!*].[53]

The construction of the world by the atoms is a spontaneous process which unfolds without the supervision of any external governing principle. We do not learn much about how the construction of the physical world actually takes place, but Cavendish hints at a possible mechanism which includes a "natural selection" of fit atoms, that is, of particles with fitting size and shape.

> For when we build of Brick or Stone,
> We lay them even, every one by one:
> And when we finde a gap that's big, or small,
> We seek out stones to fit that place whitall. [...]
> For when not fit, too big, or little be,

[51] Margaret CAVENDISH, *Observations Upon Experimental Philosophy*. Ed. Eileen O'Neill. Cambridge: Cambridge University Press 2001, p. 38.
[52] Margaret CAVENDISH, *Poems and Fanices*. London: *s.n.* 1653, p. 5.
[53] *Ibid*., p. 16.

> They [the atoms] fall away, and cannot stay, we see [...]
> Thus by their severall *Motions,* and their *Formes*,
> As severall work-men serve each others turnes,
> And thus, by chance, may a *New World* create [...][54]

Cavendish, however, experimented with different sorts of materialism at the same time because in the same year she published another work, *Philosophical Fanices* (1653) which already contained the elements of her vitalistic materialism that she would elaborate in the following years. Her final endorsement of vitalism at the expense of mechanistic atomism is not unrelated to her dissatisfaction with the explanation how "wandering and straggling" atoms moving independently in space are able to bring forth an apparently ordered universe. As she remarks in her *Observations Upon Experimental Philosophy* (1666),

> [n]either would [nature] be able to rule those wandering and straggling atoms, because they are not parts of her body, but each is a single body by itself, having no dependence upon each other. If there should be a composition of atoms, it would not be a body made of parts, but of so many entire single bodies, meeting together as a swarm of bees.[55]

Independent atoms are only able to compose heaps of atoms, because they necessarily retain their individuality. Cavendish realizes that in her house-building metaphor is inappropriate so long as the roles of the designer, the bricklayers and the bricks are all on the same level:

> in the exstruction of a house there is first required an architect or surveyor, who orders and designs a building, and puts the labourers to work; next the labourers or workmen themselves, and lastly the materials of which the house is built.[56]

These roles are assigned to the rational, sensitive and inanimate matter, respectively. Every portion of matter, however small, is composed of these three sorts of elements: "there is such a commixture of animate and inanimate matter, that no particle in nature can be conceived or imagined, which is not composed of animate matter, as well as of inanimate."[57] Rational mat-

[54] *Ibid*., pp. 5–6.
[55] CAVENDISH, *Observations upon Experimental Philosophy,* p. 129.
[56] *Ibid*., p. 24.
[57] *Ibid*., p. 158.

ter and sensitive matter are animate, that is, they are active and capable of self-movement. Inanimate matter is not self-moving, but it also has life and knowledge. Thus for Cavendish life is just as an essential and irreducible property of matter as for Glisson. But according to Cavendish, matter is also inherently cogitative and this seems to be a more fundamental property of matter than life. For Cavendish, cognition is the most fundamental manifestation of life. On this account one may say that Cavendish promotes a panpsychist form of vitalism.[58]

As to what she meant by the life of matter is not altogether clear. In her *Grounds of Natural Philosophy* (1668) she says that "all the Parts of Nature have Life and Knowledg; but, all the Parts have not Active Life and perceptive Knowledg, but onely the Rational and the Sensitive."[59] Life cannot be identical with self-movement because inanimate matter, by definition, is incapable of movement by itself yet it is said to be alive no less than the animate parts. Cavendish often and unanimously declares that even the inanimate matter has life, although at one place she attributes life specifically to the sensitive part.[60] It clear that it is on account of self-knowledge and self-sensibility that she attributes life to inanimate matter: "the inanimate part of matter may have life, according as it hath sense and knowledge; but not such a life as the animate part of matter has, that is, an active life"[61] – that kind of life is dependent on self-motion. Perhaps today we would say that inanimate matter is self-conscious and has knowledge of its own internal state, though it lacks knowledge of its external environment and the capability to organize itself.

Cavendish famously banished immaterial substance from nature and thus from natural philosophy:

> Nature is purely corporeal or material, and there is nothing that belongs to, or is a part of nature, which is not corporeal; so that natural and material, or corporeal, are one and the same; and therefore spiritual beings, non-beings,

[58] In one clear formulation of this view Cavendish writes "I believe there is sense and reason, or sensitive and rational knowledge, not only in all creatures, but in every part of every particular creature." *Ibid*., p. 151.
[59] Margaret CAVENDISH, *The Grounds of Natural Philosophy*. London: A. Maxwell 1668, p. 6.
[60] In her novel *The Blazing World*, Cavendish writes: "The sensitive [matter] is the life, the rational the soul, and the inanimate part, the body of infinite nature." Margaret CAVENDISH, "The Blazing World." In: *Political Writings*. Ed. Susan James. Cambridge: Cambridge University Press 2001, p. 63 (1–109).
[61] CAVENDISH, *Observations upon Experimental Philosophy,* p. 157.

> mixt-beings, and whatsoever distinctions the learned do make, are no ways belonging to nature.[62]

In her fiction she treated the subject with more liberty and afforded herself the boldness to turn the venerable concept of immaterial spirits on its head and ridicule it. In her philosophical novel, *The Blazing World* she says of immaterial spirits, or more precisely, the immaterial spirits themselves confess to the protagonist, the Empress, that "natural material bodies give spirits motion; for we spirits, being incorporeal, have no motion but from our corporeal vehicles so that we move by the help of our bodies, and not the bodies by the help of us."[63] We also learn about them that "soul has motion from the body, as the moon has light from the sun."[64] Cavendish's immaterial spirits are so far from being animating principles that they themselves are dependent on matter for their movement. But this is no wonder, because they have "a great affinity with non-beings."[65] For Cavendish, the only suitable place for immaterial spirits was her "work of fancy," not her "serious philosophical contemplations."[66]

Cavendish was not the only female philosopher who found immaterial spirits unappealing and opted for a monistic vitalism. Lady Anne Conway (1631–1679), the bright private pupil of Henry More and his life-long friend, also found spirits ill-equipped to fulfil the role her mentor would have assigned to them.[67] According to her, the penetrable immaterial substance is as ineffective in moving the body as the wind to move a ship equipped with a net-like sail: due to their penetrability spirits would slip through the body without any resistance and thus without power. Conway criticized the vital congruity or affinity of body and spirit, complaining that if body is totally inanimate and spirit is animated, there cannot be real congruity between them, nor is it clear why would active, self-moving spirits need corporeal

[62] *Ibid*., p. 137.
[63] CAVENDISH, "The Blazing World," p. 55.
[64] *Ibid*., p. 63.
[65] *Ibid*., p. 38.
[66] *Ibid*., p. 5.
[67] On Cavendish and Conway, see Sarah HUTTON, "Anne Conway, Margaret Cavendish, and Seventeenth-Century Scientific Thought." In: HUNTER, L. – HUTTON, S. (eds.): *Women, Science and Medicine 1500–1700. Mothers and Sisters of the Royal Society*. Stroud: Allan Sutton 1997, pp. 218–234. Henry More and Conway's remarkable friendship lasted until her untimely death despite their diverging philosophical views and her conversion to Quakerism.

structures to perform their operations.[68] Her own solution was that spirit and body were substantially the same after all:

> Truly, every body is a spirit and it differs from a spirit only insofar as it is darker. Therefore the crasser it becomes, the more it is removed from the condition of spirit. Consequently, the difference is only modal and incremental, not essential and substantial.[69]

And again, "spirit and body are of one original nature and substance, and that body is nothing but fixed and condensed spirit, and spirit nothing but volatile body or body made subtle."[70] Conway here seems to ascribe the functions traditionally attributed to immaterial substances to subtilized matter, which (as we have already seen) will be around the end of the century criticized by Grew and associated by him to Descartes and Willis. Conway, for her part, foresaw possible accusations of Cartesianism and declared that her doctrine is "so far from being Cartesianism in a new guise that it can more truly be called anti-Cartesianism."[71] Indeed, while (in a manner not unlike More) she acknowledged that Descartes ingeniously accounted for some mechanical processes, she hastened to add that in nature

> there are many operations that are far more than merely mechanical. Nature is not simply an organic body like a clock, which has no vital principle of motion in it; but it is a living body which has life and perception, which are much more exalted than a mere mechanism or mechanical motion.[72]

Conway complains that Hobbes and Descartes did not go "beyond the husk and shell."[73] According to her, there are much more exalted attributes of the extended spiritual-material substance among which she includes "life," and "the capacity for every kind of feeling and perception, or knowledge, even love, all power and virtue, joy and fruition, which the noblest creatures

[68] Anne CONWAY, *The Principles of the Most Ancient and Modern Philosophy*. Cambridge: Cambridge University Press 1996, pp. 56*ff*. This book, Conway's only known work, was published posthumously in 1690 in Latin translation. Conway's original English text no longer exists.
[69] *Ibid*., pp. 39–40.
[70] *Ibid*., p. 61.
[71] *Ibid*., p. 64.
[72] *Ibid*.
[73] *Ibid*., p. 66.

have or can have, even the vilest and most contemptible."[74] Thus Conway's universe was just as replete with, or full of, life as that of More. Both of them regarded substances as extended, and More's characterization of spirit often bordered on materialism. Indeed, as Sarah Hutton interprets the disciple's attitude towards her master's teaching, the arguments raised by Conway against More "are directed chiefly at his attempt to superimpose dualism on to his well-founded monistic intuition that body and spirit are both *res extensae* (extended things)."[75]

However, Conway could have been inspired by her mentor by an even more direct way. As I have mentioned above, early in his career, in his Platonic poems More endorsed a specific Neo-Platonism, in which the different ontological levels emanate from God but in a sense they share essential properties with him. This fundamentally divine origin manifests itself in the fact that even matter possesses remnants of the vital life of God: "I nere ment / to grant that there is any such thing existent / as a mere body: For all's life, all spright."[76] The ultimate particles of matter, at the very base of the ontological ladder are still vital in a sense, albeit devoid of formative, perceptive or cognitive power. As he explicated in his prose commentary on his poems:

> These be an infinite number of vitall Atoms that may be wakened into divers tinctures, or energies, into Fiery, Watery, Earthy, &c. [...] These be the last projections of life from the soul of the world; and are act or form though debil or indifferent; like that which they call the first matter. But they are not merely passive, but meet their information half way, as I may so speak. [...] These be the reall matter of which all supposed bodies are compounded, and this matter (as I said) is form and life, so that all is life and form what ever is in the world.[77]

As Jasper Reid explains, in More's system based on divine emanation "nothing could be *utterly* unlike its source."[78] A totally inert and passive

[74] *Ibid*. These remarks gain their true significance in the full context of the Christian-Kabbalistic soteriology of Conway's system.
[75] Sarah HUTTON, *Anne Conway: A Woman Philosopher.* Cambridge: Cambridge University Press 2004, p. 89.
[76] Henry MORE, *The Complete Poems of Dr. Henry More*. Edinburgh: Edinburgh University Press 1878, p. 114.
[77] *Ibid*., p. 160.
[78] REID, *The Metaphysics of Henry More,* p. 245. In his famous correspondence with Descartes at the end of the 1640s, More describes matter in the same vein: "And, in fact, all that is called 'body' is really a stupefied and sottish life, inasmuch as, though it has neither sensation nor

matter would be, however, really *utterly* different from God. Interestingly, decades later Conway would argue along similar lines: she rejects the notion of a totally inert matter on the account that it does not share anything in common with God: "Since dead matter does not share any of the communicable attributes of God, one must then to conclude that dead matter is a non-being, a vain fiction and a Chimera, and an impossible thing."[79] Thus More's youthful notion of active matter came back to haunt him in his old day in the shape of his favourite disciple's philosophy. It might have been for him intellectually and personally disturbing, but to posterity it points to an important lesson: that the boundary between inert matter and active matter, a thoroughgoing materialism and spiritualism which for More and his kin made all the difference between true religion and atheism, between a divinely ordered providential universe and a chaotic rambling of material particles, was much more precarious and uncertain than they sought to present it to their audiences with all their eloquence and intellectual effort.

Conclusion

The fate and fortune of vitalism waxed and waned after the seventeenth-century, but the kind of universal or cosmic vitalism was henceforward clearly on the decline. Ku-Ming Chang argues that at the turn of the century Georg Ernst Stahl "articulated a vitalism of a new age," and that after him "vitalists never reclaimed the inorganic world as their territory" and vitalism was thereafter "confined to the life sciences."[80] Although Stahl was in dialogue and in opposition first and foremost with the alchemical and medical vitalism that remained outside the scope of the present study, and to the decline of the types vitalism I discussed contributed different factors as well (such as the Lockean scepticism concerning the real essence of substances and the epistemological turn of philosophy), it is still important to note that at this point the science of matter and the science of life parted ways. As Canguilhem declared, the "the philosophically inexcusable fault" of (classical) vitalism lies in its restraint from the incorporation of the whole realm of nature. At least mechanists were honest imperialists who invaded both the inorganic and the organic world. According to Canguilhem,

animadversion, it constitutes the last and faintest shadow and image of the divine essence, which I take to be the most perfect life." As cited in *ibid*., p. 247.

[79] CONWAY, *The Principles of the Most Ancient and Modern Philosophy,* p. 46.

[80] Ku-Ming Kevin CHANG, "Reconsidering the Place of Vitalism in Early Modern Chymistry." *Isis*, vol. 102, 2011, no. 2, pp. 327–328 (322–329).

> [t]here can be only one philosophy of empire, that which refuses any division: imperialism. The imperialism of [mechanist] physicists or chemists is thus perfectly logical, pushing to its limit the expansion of logic or the logic of expansion. One cannot defend the originality of the biological phenomenon, and consequently the originality of biology, by demarcating within the physico-chemical territory – that is, within the milieu of inertia, of externally determined movements – enclaves of indetermination, zones of dissidence, or foyers of heresy. If one is to assert the originality of the biological, this must be in terms of the originality of one realm over the whole of experience, and not over islets of experience. In the end, classical vitalism sins, paradoxically, only in its excessive modesty, in its reluctance to universalize its conception of experience.[81]

Following this line of argument we might conclude that the vitalisms of More, Glisson, Cavendish and Conway, together with other (including chymical and medical) "imperialists," represent vitalism's pristine, or if you will, pre-lapsarian state.

[81] CANGUILHEM, "Aspects of Vitalism," p. 70.