LIFE AS "SELF-MOTION": DESCARTES AND "THE ARISTOTELIANS" ON THE SOUL AS THE LIFE OF THE BODY

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DESCARTES'S ARGUMENTS THAT THE BODY can be considered a self-propelled machine rely on a misuse of the Aristotelian concept of "self-motion." They depend upon the premise that life is self-motion, the Aristotelian definition which Descartes learned from Latin handbooks at La Flèche. By retaining this premise, Descartes believed he was defeating the Aristotelians on their own turf when he argued that soul is unnecessary for explaining life functions (self-motion). However, his arguments fail to establish what he intended them to, because whereas Aristotle meant the capacity for self-induced alteration (qualitative motion), Descartes interpreted "self-motion" as a reference to the local motions of the constitutive parts of a body. That this was a misunderstanding, and not simply a disagreement with Aristotle's meaning, can be demonstrated from the *Meditations*, the *Discourse*, the *Treatise on Man*, the *Passions of the Soul*, *The World*, and the letters. Owing to this misinterpretation, Descartes never actually addressed the Aristotelian theory, and so his physics leaves unresolved a problem that Aristotle is able to solve by positing the soul as the life of the body, namely: Why do some things metabolize, but others do not?

Surprisingly, these points have not yet been made. Though Des Chene has recently drawn attention to the question of "life" in Descartes, he has not noticed this.[1] Michael Frede has noted that from

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[1] See Dennis Des Chene, *Spirits and Clocks: Machine and Organism in Descartes* (Ithaca: Cornell University Press, 2001), esp. 15–31; *Life's Form: Late Aristotelian Conceptions of the Soul* (Ithaca: Cornell University Press, 2000), esp. 55–63, 112–13; and *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought* (Ithaca: Cornell University Press, 1996). See also earlier, Ann W. MacKenzie, "A Word About Descartes' Mechanistic Conceptions of Life," *Journal of the History of Biology* 8 (1975): 1–13.

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Aristotle's point of view, Descartes's conception of the mind is "fundamentally mistaken because it does not even try to explain the life of an organism, since it rests on the assumption that the ordinary life functions can be, and have to be, explained in terms of matter and its properties,"[2] though without observing that Descartes actually relies upon Aristotle's definition of life when he makes this assumption about matter. The other secondary literature has focused on questions of body–soul dualism and immortality rather than the definition of life.[3] It is true that in his own day, Descartes was accused of "withholding life" from animals,[4] and it was objected that the "movements" of animals were too complex to be explained without reference to a soul;[5] yet the precise problem with his account was never pinpointed. As I shall demonstrate, his misuse of "self-motion" was overlooked or shared by all of his contemporary objectors on record: Gassendi, Mersenne, Bourdin, More, and Fromondus. This latter fact indicates a serious weakness at least in the pedagogy, and perhaps also in the actual understanding of Aristotle, in the faculties of western Europe at the beginning of the seventeenth century.

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[2] Michael Frede, "On Aristotle's Conception of the Soul," in *Essays on Aristotle's* De Anima, ed. Martha Nussbaum and Amélie Rorty (Oxford: Clarendon, 1992), 94.

[3] For recent discussion of these topics and references to the previous work, see Lilli Alanen, *Descartes's Concept of Mind* (Cambridge: Harvard University Press, 2003), 44–77; Joseph Almog, *What Am I?* (Oxford: Oxford University Press, 2002); Dennis Des Chene, "Life and Health in Cartesian Natural Philosophy," in *Descartes' Natural Philosophy*, ed. Stephen Gaukroger, John Schuster, and John Sutton (London: Routledge, 2000), 723–35; C. F. Fowler, *Descartes on the Human Soul* (Dordrecht: Kluwer Academic Publishers, 1999); and Roger Ariew, *Descartes and the Last Scholastics* (Ithaca: Cornell University Press, 1999).

[4] Henry More, Letter to Descartes, 11 December 1648, in *Oeuvres de Descartes* (hereafter, "AT"), ed. Charles Adam and Paul Tannery, rev. ed. (Paris: Vrin/C.N.R.S., 1964–76), 5:243 and following. For translation and discussion, see Louise D. Cohen, "Descartes and Henry More on the Beast-Machine—A Translation of their Correspondence Pertaining to Animal Automatism," *Annals of Science* 1, no. 1 (1936): 48–61. This letter from More is treated below.

[5] Mersenne to Huygens, September 1646, in *Correspondance du P. Marin Mersenne, religieux minime*, ed. P... Tannery et al., vols. 1–2 (Paris: Beauchesne, 1932); vols. 3–4 (Paris: Presses Universitaires de France, 1945); vol. 5–17 (Paris: C.N.R.S., 1960), 14:496–7. This passage is treated below.

I

Self-Motion in the Texts of the Aristotelian Commentaries and of Descartes. In a letter to Mersenne in 1640, Descartes mentioned that from among the philosophical texts he studied at La Flèche, he especially remembered those of the Jesuits of Coimbra (hereafter referred to as the Conimbricenses), and of the Spanish Jesuit Toletus.[6] The Conimbricenses' texts were first published in 1592 and 1602; those of Toletus were first published in 1572. These were commentaries on the works of Aristotle, as the philosophy curriculum of the Jesuit schools focused almost exclusively on Aristotle[7]—though the commentaries made reference to others (for example, Plato, Albert the Great, Aquinas, Averroes, Cajetan).[8] Natural philosophy was taught in the second year.[9] Thus we can confidently conclude that the definition of life which Descartes learned was Aristotle's—as it was presented in the commentaries—and that he learned it in his second year.

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[6] 30 September 1640; AT 3:185; *The Philosophical Writings of Descartes* (hereafter, "CSM" for vols. 1–2 and "CSMK" for vol. 3), ed. John Cottingham et al. (Cambridge: Cambridge University Press, 1985–91), 3:153–4. On the question of when Descartes read Eustachius a Sancto Paulo's *Summa Philosophiae*, see recently Fowler (*Descartes on the Human Soul*, 196), who argues that he did not know it until late 1640. Des Chene notes that on some points Eustachius (in his *Summa Quadripartita*) draws upon the Conimbricenses to the point of verbatim repitition ("Descartes and the Natural Philosophy of the Coimbra Commentaries," in *Descartes' Natural Philosophy*, 30). For discussion of the commentary as one of a number of genres in natural philosophy in this period, see Margaret Osler, "Gassendi and the Aristotelian Origin of Physics," in *Renaissance and Early Modern Philosophy*, ed. Peter French and Howard Wettstein (Malden, Mass.: Blackwell, 2002), 172 and following.

[7] See Georg M. Pachtler, *Ratio Studiorum et Institutiones Scholasticae Societatis Iesu* (Berlin: A. Hoffman and Co., 1887–94), esp. 2:332 and following.

[8] For discussion of "non-Thomist" elements in Descartes's scholastic training, see Marjorie Grene, *Descartes Among the Scholastics* (Milwaukee: Marquette University Press, 1991), 11 and following; her treatment should be balanced, however, by Des Chene, "Coimbra Commentaries," 30, 31, 40; and Alan Gabbey, "New Doctrines of Motion," in *The Cambridge History of Seventeenth-Century Philosophy*, ed. Daniel Garber and Michael Ayers (Cambridge: Cambridge University Press, 1998), 1:671.

[9] See Pachtler, *Ratio Studiorum*, 332 and following; Ariew, *Descartes and the Last Scholastics*, 9; and Geneviève Rodis-Lewis, *Descartes* (Ithaca: Cornell University Press, 1998), 15.

If we turn now to the commentaries themselves, we find that the Conimbricenses' commentary on the *Physics* defines life as follows: "to move oneself immediately and as the principal cause of one's own motion is the proper office of life" (*movere se simpliciter et ut principalem sui motus causam est proprium munus vitae*).[10] In the same passage, a shorthand way of referring to this characteristic of living things is given, namely "self-motion," *sese movere*.[11] In addition to book 8, chapter 4 of Aristotle's *Physics*, the authorities given for this definition include book 10 of Plato's *Laws*, and the *Phaedrus*, which are summarized as follows: "that thing whose movement is from the outside, is inanimate, but that to which it is intrinsic to itself to be moved by itself, is alive" (*cui forinsecus est moveri, id inanimatum est, cui vero intrinsecus sibi ex se, animatum*).[12] This summary is accompanied by the Greek of *Phaedrus* 245e, in which the key phrase is "a body which has its motion from itself" (*sôma . . . hô de endothen autô ex hautou to kineisthai*).[13] The commentary concludes that philosophers hold it as axiomatic that to have the principle of motion inside oneself (*moveri ab intrinseco*) is the defining characteristic of living things. They include Aquinas in this company by mentioning *Summa Theologiae* I, q. 18, a. 1.

Similarly, in Toletus' commentary on the *Physics* we read: "To live is nothing other than a certain self-motion (*se movere*), and movement of one's own (*motus sui*) is a kind of life: and all things which by some motion move on account of themselves (*per se*), and by an essential principle . . . live . . . Life consists in this, that something essentially has an active principle . . . of some motion within itself."[14]

It is plain from what he says in a number of places that Descartes knew this definition of life, and had learned that the soul (*anima*) was the principle of life in any animate thing. Thus in the Second Medita-

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[10] *Commentarii Conimbricenses in Octo Libros Physicorum Aristotelis* bk. 8, chap. 3, q. 1, a. 2. Translations of the Conimbricenses and of Toletus are my own.

[11] Ibid.

[12] Ibid.

[13] Plato here gives this as the definition of an ensouled body; motion (*kinêsis*) is identified with life just before, at 245c.

[14] *In Octo Libros Aristotelis de Physica*, bk. 2, chap. 2, text 15, q. 2: "Vivere non aliud est quam quoddam se movere, et vita quaedam motus sui: et omnia quae se aliquo motu per se, et a principio essentiali . . . movent, vivunt . . . . Vita consistat in hoc quod aliquid habeat essentiale principium . . . activum alicuius motus in se."

tion, when recounting what he used to think before he began to doubt his scholastic education, he recalls:

> What then did I used to think I was? A man. But what is a man? Might I not say a 'rational animal'? . . . [I]t occurred to me that I took in food (*me nutriri, me nourissois*), that I walked about, and that I sensed and thought various things. These actions I used to attribute to the soul (*anima, l'âme*). . . . For it was my view that the power of self-motion (*vim seipsum movendi, la puissance de se mouvoir*), and likewise of sensing and thinking, in no way belonged to the nature of the body. Indeed I used rather to marvel that such faculties were to be found in certain bodies.[15]

Moreover, in the *Discourse*, when Descartes rejects the traditional claim that the soul is the principle of life, he retains the definition of life and depends on it as the main premise of his argument. He argues by positing causes for the "movements" of live bodies. The words *mouvement* and *mouvoir* occur six times during the course of the argument.[16] He thus believes himself to have beaten the Aristotelians on their own turf, and announces:

> I want to put them [the Aristotelians] on notice that this *mouvement* which I have just been explaining follows just as easily from the mere disposition of the organs that can be seen in the heart by the naked eye, and from the heat that can be felt with the fingers, and from the nature of blood, which can be known from observation, as does the *mouvement* of a clock from the force, placement, and shape of its counterweights and wheels.[17]

We notice, moreover, that the movements to which Descartes appeals in this part of the *Discourse* are all local motions: the expansion and contraction of the heart, the passage of the blood from the heart cavity into the lungs, the opening and closing of the ventricles of the heart, the traveling of the "animal spirits" to the brain.[18] The same examples of motion recur when he argues against the Aristotelians in

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[15] Meditation Two; AT 7:25–6; AT 9.1:20–21; CSM 2:17–18. Regarding the use of both French and Latin in this quotation: the *Meditations* were published in Latin in 1641, but a second Latin edition with minor corrections was published in 1642 (becoming the "definitive" one, for example, in AT); a French translation with Descartes's approval was published in 1647.

[16] *Discourse*; AT 6:46–50, 54; CSM 1:134–6.

[17] *Discourse*; AT 6:50; CSM 1:136.

[18] *Discourse*; AT 6:46–50, 54; CSM 1:134–6. On Descartes's use of Harvey, Vesalius, and Bauhin on circulation (but disagreement on conceptual framework), see recently Annie Bitbol-Hespéries, "Cartesian Physiology," in *Descartes' Natural Philosophy*, 349–82.

other texts; we find them in his treatise *On Man*,[19] his Letter to Elizabeth of March 1647,[20] and his *Passions of the Soul*.[21]

Thus the preceding argument against the Aristotelians can be schematized as follows. The Aristotelians believe that the changing positions of organs and fluids in the body are mysterious and therefore in need of *anima* to explain them. Contemporary biology and mechanics have dispelled any such mystique; therefore, a vegetative soul is an unnecessary hypothesis.

Descartes's argument that heat is the ultimate source of motion in live bodies also relies on the traditional definition of life as self-motion, and interprets it as local motion. In a letter to Henry More in 1649, Descartes says he holds that life "consists in nothing other than the heat of the heart."[22] In *The World*, he defines heat as the velocity or agitation of tiny component particles (*petites parties qui se remuent*).[23] So Descartes understands the movement of the constitutive parts of a live body to be the result of heat,[24] which is itself the movement of particles of matter. Thus, in the *Treatise on Man* the "principle of movement and life" (*principe de mouvement et de vie*) is the blood and spirits agitated (*agitez*) by the heat of the heart,[25] where heat is to be understood as the local motions of particles.

In the texts I have cited thus far, Descartes has retained the definition of life as self-motion and limited "self-motion" to live bodies. There is, however, no reason for him to limit it if motion simply means local motion. For all material objects are composed of particles that move in that sense—their constitutive particles, which we call mole-

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[19] AT 9:130 and 201–2; CSM 1:100 and 107–8.

[20] Letter 180; AT 4:625–7; CSMK 3:314–15.

[21] AT 11:330; CSM 1:329.

[22] AT 5:267; CSMK 3:360.

[23] AT 11:7–10; CSM 1:83–4. Actually it is flame that is first identified as agitation/movement of particles (AT 11:7–9); then heat is said to be another name for this motion (AT 11:9).

[24] See *Passions*; AT 11:330; CSM 1:329.

[25] AT 11:202; CSM 1:108: literally, agitated by the heat of the fire which continually burns in the heart; but see n. 23 above. On this passage compare Marie B. Hall, "Matter in Seventeenth Century Science," in *The Concept of Matter in Modern Philosophy*, ed. Ernan McMullin (Notre Dame: University of Notre Dame Press, 1963), 9–15. On Harvey's association of spontaneous motion with life, where the motion is understood as the local motion of blood, of which heat is the presupposition, see Thomas Fuchs, *The Mechanization of the Heart: Harvey and Descartes* (Rochester: University of Rochester Press, 2001), 48–9, 58–9.

cules,[26] continually collide with one another and change direction, as Descartes had supposed in chapter 7 of *The World*.[27] When "intrinsecus motus" is interpreted as the local motion of tiny parts, then anything material has self-motion; and this is precisely what Descartes claims in *The World*: the local motions of particles are instances of self-motion (*se mouvoir*).[28] God set particles in motion when he created them, but from that instant they move without any extrinsic cause of their agitation.[29] The creation of matter, and inertia,[30] are sufficient to explain the heat of a live body.

Here, then, is another and more fundamental argument that it is not necessary to invoke soul in order to account for life. (a) Life is heat, (b) heat is the local motion of molecules, (c) molecules are self-moving, therefore (d) heat requires no cause outside itself. Thus "it is an error to believe that the soul imparts motion and heat to the body."[31]

If all material objects have self-motion at the micro-level because of the changing positions of their molecules (and, as we now know, of their subatomic particles), then live bodies and automata have this same type of internal motion of parts on the macro-level. Thus Descartes asserts that artefacts have self-motion: "clocks, artificial fountains, mills and other such things are not without the power of self-motion (*ne laissent pas d'avoir la force de se mouvoir d'elles-mesmes*)."[32] And he famously states that there is no difference between the internal motions of automata and live bodies:

> I should like you to consider . . . all the functions I have ascribed to this machine—such as the digestion of food, the beating of the heart and the

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[26] Hereafter I shall use "molecule" for Descartes's "bodies so small that we cannot perceive them and of which every body is composed" (a paraphrase of *Principles of Philosophy*; AT 8A:325; CSM 1:287). I consider this acceptable, despite the fact that Descartes does not use it in these texts (and despite the fact that the English word "molecule" was not coined until 1678) since Descartes is clearly talking about what we call molecules. Gassendi uses *moleculas* in 1658; see *Syntagma*, pt. 2, sec. 1, bk. 4, chap. 8, in *Opera Omnia in sex tomos divisa* (Lugduni: Sumptibus Laurentii Anisson et Ioan. Bapt., Devenet, 1658–75), 337, left col.

[27] AT 11:37; CSM 1:92.

[28] Ibid.

[29] Ibid.

[30] For inertia see *The World*; AT 11:38; CSM 1:93.

[31] *Passions*; AT 11:330; CSM 1:329.

[32] *Treatise on Man*; AT 11:120; CSM 1:99.

> arteries, the nourishment and growth of the limbs, respiration . . . I should like you to consider that these functions follow from the mere arrangements of the machine's organs every bit as naturally as the *mouvements* of a clock or other automaton follow from the arrangements of its counterweights and wheels. In order to explain these functions, then, it is not necessary to conceive of this machine as having any vegetative or sensate soul or other principle of *mouvement* and life, apart from its blood and its spirits, which are agitated by the heat of the fire burning continuously in its heart—a fire which has the same nature as all the fires that occur in inanimate bodies.[33]

As I hope is now clear, Descartes has gotten into this position by retaining and relying on the Aristotelians' definition of life as self-motion, while interpreting it as internal local motion.

II

Aristotle's Actual Position and the Relative Philosophical Merits of the Aristotelian and Cartesian Positions. Consistent though Descartes's application of the notion of "self-motion" may be, it prevents him from actually engaging the Aristotelian argument that there must be a soul which is the cause of life in a body. Aristotle used the phrase "self-motion" for internally initiated activity[34] in the sense of self-induced alteration, that is, self-induced qualitative change. The qualitative change referred to was change of the constitutive matter of

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[33] *Treatise on Man*; AT 11:202, CSM 1:108.

[34] So also Jennifer Whiting, "Living Bodies," in *Essays on Aristotle's* De Anima, 75–91 ("living bodies . . . have their own internal efficient causes of motion and rest," 91) and S. Sauvé Meyer, "Self-Movement and External Causation," in *Self-Motion from Aristotle to Newton*, ed. Mary L. Gill and James G. Lennox (Princeton: Princeton University Press, 1994), 65–80. Sauvé Meyer holds that a self-mover is an efficient cause of its motion in the sense of "being the origin [*archê*] of an action." This interpretation is closer to the texts and explains a larger number of texts (see esp. 65–6, 73 n. 12, 78–80) than Gill's in the same volume ("Aristotle on Self-Motion," 15–64). Gill interprets *archê* to mean that the soul merely regulates (determines the order, timing, and "extent" of) motions going on in the simple materials of the body; she denies that the soul initiates the activity of self-nutrition (21–3). That requires downplaying or overlooking Aristotle's words in the *Physics* (cited below), and the *di hautou* of *On the Soul* 2.1 (412a14), cited by Sauvé Meyer ("Self-Movement," 73 n. 12). Elsewhere in this volume, David Furley ("Self-Movers," 3–14) suggests that Aristotle cannot consistently maintain that the self-mover is unmoved by external objects (14); for an interesting discussion of this, see Sauvé Meyer, "Self-Movement," 71 and following.

a body. He was referring to what we call metabolism—which is, at the most basic level, as we now know, the constantly newly initiated changes by which protoplasm is built up and destroyed. To establish this, we must turn to texts which illustrate the senses of "motion" in use at the time of Aristotle and those used by Aristotle himself.

In classical philosophical Greek, *kineisthai* and *kinêsis* mean both to change place and more generally to change. Plato had made the distinction in the *Theaetetus*:

> when a thing changes from one place to another or turns round in the same place . . . here is one form of motion (*kinêsis*). Then supposing a thing remains in the same place, but grows old, or becomes black instead of white, or hard instead of soft, or undergoes any other alteration; isn't it right to say that here we have motion (*kinêsis*) in another form? . . . Then I now have two forms of *kinêsis*: alteration (*alloiôsis*) and spatial movement (*phora*).[35]

In Aristotle's texts, too, "motion" (*kinêsis*) means change (*metabolê*) generally,[36] and has four distinct senses, two of which are locomotion and alteration. Thus we find: "It is always with respect to substance or to quantity or to quality or to place that what changes changes."[37] In other words, something may "move" by coming into or passing out of existence (movement/change with regard to substance), by diminishing or increasing in overall size (movement/change with regard to quantity), by altering its state (movement/change with regard to quality), or by changing its location (movement/change with regard to place).[38]

We may easily infer that Aristotle intends motion-as-alteration when he elsewhere defines life as "self-motion," for he treats "self-nourishment" as a synonym for both "self-motion" and "alteration."

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[35] *Theaetetus* 181c–d. Slightly adapted from the M. J. Levett and Myles Burnyeat translation (*Theaetetus*, ed. Bernard Williams [Indianapolis: Hackett, 1992]).

[36] Thus he treats the terms "change" (*metabolê*) and "motion" (*kinêsis*) as synonyms when defining motion in *Physics* 3.1, sometimes replacing one word with the other, and repeatedly pairing the two, as in the phrases *kinêsis oude metabolê*, *kinêseôs kai metabolês*.

[37] *Physics* 3.1.200b33–4: "metaballei gar aei to metaballon ê kat'ousian ê kata poson ê kata poion ê kata topon" (trans. Robert P. Hardie and R. K. Gaye, in *The Complete Works of Aristotle: The Revised Oxford Translation*, ed. Jonathan Barnes [Princeton: Princeton University Press, 1984].

[38] See *Physics* 3.1.201a2–9.

Thus in his discussions of living things, he refers to three of the four senses of "motion" just given: diminution or growth (quantity), alteration (quality), and locomotion (place).[39] *Self*-motion is identified as the differentiating characteristic of living things in *Physics* 8.2 (*to zôon auto phamen heauto kinein*, 252b22–23), 8.4 (*to auto huph'hautou kinoumenon*, 254b14–15), and 8.6 (*ha kinei auta heauta*, 259b2–3).[40] When we look for further explanation of this self-motion, it becomes clear that Aristotle considers self-nourishment to be its only requirement; this is said to be the most basic function, found in all living things, at *On the Soul* 413a–b and 415b23 and following.[41] Moreover, growth and diminution are said to presuppose self-nourishment.[42] Thus when he says that either locomotion, growth/diminution, or nourishment is sufficient to distinguish something as alive, the meaning is that locomotion and growth/diminution are always signs of the power of self-nourishment, which is the more basic power.[43]

Since Aristotle explains two of the three relevant senses of motion (quantity and place) as signs of life itself, which he identifies with self-nutrition, by process of elimination we conclude that of the senses of motion possible for life/self-motion/self-nutrition, "alter-

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[39] See *On the Soul* 1.3.406a12–14 and *Physics* 2.1.192b14–15.

[40] Note that the definition "life is self-motion" pertains to life in the sublunar mutable substances only; an all-encompassing definition of life would be "self-dependent actuality." Actuality, *energeia*, is the name of a genus which includes both motion from potentiality to actuality (*kinêsis*), and simple actuality (the state of being actualized, also called *energeia*), on which see Whiting, "Living Bodies," 89. The immutable First Mover, for instance, is said to be alive because it has the self-dependent actuality of thought: that is, it contemplates itself (rather than an object outside itself, which would make it dependent on another); see *Metaphysics* 12.7.1072b20–30, *hê nou energeia zôe . . . energeia hê kath'hautên*. Again, the indestructible bodies of the heavens have souls by which they move locally (in orbit), but do not alter (see *Metaphysics* 12.7.1072b5, 1073a30). G. Matthews does not raise the foregoing possibility as Aristotle's intended definition of life when he suggests that life ought to be defined as possession of the power to act so as to preserve one's species (see "*De Anima 2.2–4* and the Meaning of Life," in *Essays on Aristotle's* De Anima, 185–93).

[41] *Kinêsis hê kata trophên, lambanein trophên, to threptikon, trophêi chrêsthai.* A tendency toward reproduction is concomitant; self-maintenance is accomplished "for the sake of" it (*On the Soul* 2.4.415a26 and following).

[42] *On the Soul* 2.4.415b26–9. Thus growth is distinguishable from the "growth" of, say, crystals, which do not increase quantitatively as a result of the qualitative change which is metabolism.

ation" must be the one intended. Indeed, he interchanges "alteration" with "self-nourishment" when he gives synonymous lists of the characteristic motions of living things: "alteration, growth, decay" is interchanged with "self-nourishment, growth, decay."[44] Thus "life is self-motion" is equivalent to "life is self-alteration in the form of self-nourishment," an alteration of the constitutive matter of a body by means of assimilation and elimination. In more contemporary and colloquial language, by "life is self-motion," Aristotle means that life is self-induced change, in the sense of metabolism.

Aristotle, then, thinks we must posit a soul for living things because not all material objects alter themselves by assimilating elements from the outside, as he says:

> Of natural bodies [that is, three-dimensional objects that are not artifacts] some have life within them, others not; by life we mean self-nutrition and growth and decay. *It follows that* every natural body which has life in it is a substance in the sense of a composite [that is, is composed of both matter and life] . . . for the body is the subject or matter, not what is attributed to it [namely, life] . . . thus soul is the actuality of a body as above characterized [namely, potentially having life in it].[45]

Soul, Aristotle specifies elsewhere, uses heat and cold as instruments (*organa*) when it thus assimilates matter.[46]

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[43] See *On the Soul* 2.2.413a23–31, and compare 415a for the hierarchy of types of souls and the inclusion of more primitive functions at the more sophisticated levels. For a useful summary of Aristotle's account of soul generally, see Philip van der Eijk, "Aristotle's Psycho-Physiological Account of the Soul–Body Relationship," in *Psyche and Soma*, ed. John Wright and Paul Potter (Oxford: Clarendon, 2000), 55–77.

[44] Sometimes locomotion is included in these lists, at other times not; this is because locomotion is found only in some sensate beings and in humans, not in all living things (see for example, *On the Soul* 2.3.415a6–7). For the interchanging of "alteration" and "nutrition," compare *On the Soul* 1.3.406a12–14 (*phoras alloiôseôs phthiseôs auxêseôs*) and *Physics* 2.1.192b14–15 (*archên echei kinêseôs . . . kata topon, ta de kat'auxêsin kai phthisin, ta de kat'alloiôsin*) with *On the Soul* 2.1.412a14–15 (*zôên de legomen tên di' autou trophên te kai auxçsin kai phthisin*), and *On the Soul* 2.2.413a25 (*kinêsis hê kata trophên kai phthisis te kai auxêsis*).

[45] *On the Soul* 2.1.412a14–20 (trans. Hardie and Gaye, in *The Complete Works of Aristotle*).

[46] *Generation of Animals* 2.4.740b32–3. For useful discussion of this and related passages, see R. A. H. King, *Aristotle on Life and Death* (London: Duckworth, 2001), 20–1, 42–3, 50–1, 52–3, and Geoffrey E. R. Lloyd, "Aspects of the Relation between Aristotle's Psychology and Zoology," in *Essays on Aristotle's* De Anima, 153.

Given Aristotle's intent that self-nutrition be understood as equivalent to motion as alteration, Descartes's arguments that the soul is not needed for the life of the body simply miss the mark altogether. By interpreting the phrase "self-motion" to mean the local motions of parts, and then arguing against "the Aristotelians" that even soulless bodies are comprised of moving parts or particles, he is attacking a straw man.

Descartes will not so easily admit defeat, however. Even were his misuse of the phrase "self-motion" in the arguments cited above brought to his attention, he would presumably say that it does not matter, since in his opinion self-nutrition is reducible to, in the sense that it is merely a name for, the inertial local motions of particles.[47] Hence we must ask: What would the Aristotelian response be in this case?

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[47] Note that neither Aristotle's *Physics* 8.7 nor his *On the Movement of Animals* 5 ought to be interpreted as saying that each qualitative change is reducible to local motion or that "local motion is the only genuine self-motion in animals," *pace* Martha Nussbaum, *Aristotle's De Motu Animalium* (Princeton: Princeton University Press, 1978), 327 (compare 328). Compare Roger Ariew and Alan Gabbey, "The Scholastic Background," in *Cambridge History* 1:440; Alan Gabbey, "New Doctrine of Motion," in ibid., 649 (referring to *Physics* 8.7 through the intermediary texts of de la Rochepozay, Magirus, and Keckerman).

In *Physics* 8.7, Aristotle's argument that local motion is the primary sort of motion in the sense that it is the kind on which the other sorts depend, does not mean that each qualitative change is reducible to local motion. He asserts merely that there must be local motion in the universe in order for qualitative change to occur in the universe. His argument is: whatever is altered (by another) is altered by the presence of something else; therefore locomotion (approach of one object to another) is implied (260b3–6).

The argument of *De Motu* 5 may be summarized as follows: Is it the case that the animal qua self-nurturer (and not only qua the cause of its own local motions) requires something at rest outside itself? (700a27–8; compare chap. 4). Yes it is. For every animal (self-nurturer) is begotten of parents, which begetting is dependent on the prior local motion(s) of the parent organism(s) (700a29–33). And every local motion requires something unmoved (in relation to the one moving), against which the moving one "supports itself" (compare 698a15–20). Thus self-induced alteration and growth require something at rest outside themselves (700a34–b2). The key phrase is in 700a31–2: "this [namely, local motion] is the primary motion in the completed creature" (trans. Nussbaum, 36). Aristotle's meaning is that once an organism has been generated, it (of course) remains true that the local motion of the parents was the *sine qua non* (primary motion) of its generation, and therefore of its subsequent self-nutrition and growth.

The response would be to point out that there is an observable difference between living and nonliving things, which remains regardless of the presence of heat (rapid locomotion of the particles). Heat is not in fact sufficient for metabolism. Automata and rocks do not convert and assimilate matter even when we agitate their constitutive particles with microwaves. Raising the heat content of an object to the point where its particles are moving at the same velocity as those of a living, warm body does not result in self-nourishment.

It is interesting to note that Aristotle himself, as if distinguishing his position from that of Descartes far in advance, clearly indicates that he would not accept the suggestion that self-motion is reducible to the inertial local motion of bodily parts set in motion by, say, the First Mover. In *Physics* 8.4, he makes it explicit that "self-motion" requires being an efficient cause of one's own movement, rather than simply undergoing movement or change. He insists that only living things have motion that is derived from themselves (*huph' hautôn*),[48] and goes on to contrast self-motion with the sort of local motion that Descartes later ascribes to molecules. The text runs as follows: "the real cause of the motion of a ball rebounding from a wall is . . . the thrower. So it is clear that . . . the thing does not move itself (*ouden . . . auto kinei heauto*), but it contains within itself the source of motion not [in the sense] of moving something or of causing motion (*ou tou kinein oude tou poiein*), but of suffering it (*tou paschein*)."[49] Clearly when Descartes describes material particles that have been set in motion by God and afterward allegedly "move themselves (*se mouvoir*)," he is talking about suffering motion, not causing self-motion.

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[48] *Physics* 8.4.255a5–7. Aristotle here raises the question: "From whence are the natural motions of non-living things (for example, heavy things moving downward) derived?" He immediately rules out the possibility that these are derived from the things themselves: "It is impossible to say that their motion is derived from themselves. For this is a characteristic of life and peculiar to ensouled things" (translation adapted from *The Complete Works of Aristotle. To te gar auta huph'hautôn phanai adunaton. Zôtikon te gar touto kai tôn empsuchôn idion*).

[49] *Physics* 8.4.255b27–31. I here use the version of Hardie and Gaye's translation in *The Basic Works of Aristotle*, ed. Richard McKeon (New York: Random House, 1941), rather than the version of the same in *The Complete Works of Aristotle.*

III

The State of the Aristotelian Account of Life in Descartes's Day. We may now briefly consider the sixteenth-/seventeenth-century reception of Aristotle's explanations of self-motion, so as to answer the question: What historical factors, if any, prevented Descartes from actually engaging this concept? We begin with a hypothesis. Perhaps the Aristotelian commentaries were misleading on the meaning of the term "self-motion."

Moveri, se movere, and *motus,* the Latin translations of the words *kineisthai* and *kinêsis* that were used in the Middle Ages and in the commentaries known to Descartes, can, like their Greek ancestors, mean change generally, in addition to locomotion. Was this made clear in the commentaries of Aristotle which Descartes knew at La Flèche? Yes it was. The commentaries on the *On the Soul* and the *Physics* do state that among the meanings of "motion" (*motus*) is change (*alteratio, mutatio*).[50] Moreover, in the *On the Soul* commentaries, "activity" (*operatio*) is offered as a synonym for "life" (*vita*), claiming Aristotle's authority: "life is activity (*operatio*), and about this Aristotle was speaking";[51] "The definition of substantial life is explained as a doing [something] and engaging in activity of one's own self."[52]

However, the commentaries can be faulted for requiring too much synthesis on the part of the reader. When they give the defini-

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[50] Conimbricenses, *In Libros De Anima,* lib. 1, cap. 3, text 38: "Igitur quattuor sint motus, latio, alteratio, acretio, atque discretio." At Conimbricenses, *In Physic.,* lib. 2, cap. 2, q. 1, *motus* is identified with *mutatio, fluxus, successiva et continua alicuius formae acquisitio, ad formam tendere, actus,* and *paulatim progrediens.*

[51] Toletus, *In Libros De Anima,* lib. 1, cap. 5, text 95: "operatio vita est, et de hoc loquitur Aristoteles."

[52] Conimbricenses, *In Libros De Anima,* lib. 2, cap. 2, exp.: "Explicatur ratio vitae substantialis per ipsius effectum, et operationem."

Moreover, when listing the life functions in their commentaries on the *On the Soul,* they associate these functions with "internal" activity and activity "from oneself," which is reminiscent of their definitions of life as self-motion in the *Physics* commentaries. Thus, in Toletus we find: "from the inside, they [plants] are caused to grow and are nourished" (Toletus, *In Aristotelis Libros De Anima,* in lib. 2, cap. 2, text 14); and in the Conimbricenses: "But by life we mean nutrition [and] growth . . . which truly comes about through that thing itself, which is said to live." Conimbricenses, *In Libros De Anima,* lib. 2, cap. 1, text 3: "vitam autem dicimus nutritionem, accretionem, atque decretionem, quae quidem per id idem fit, quod vivere dicitur."

tion of life as self-motion it is in the *Physics* commentaries,[53] and they do not state there which sense of motion is intended for "self-motion." Aquinas, who is alluded to but not quoted in the Conimbricenses' commentary,[54] may serve as a foil here. When defining life in *ST* I, q. 18, a. 2, he uses the terms *se movere* and *movere seipsum*, and then immediately explicitly gives "self-induced activity" (*agere se ad operationem*) as a synonym for these, apparently taking pains to indicate the sense of *movere* because he knows it will not be immediately obvious.

An additional hypothesis is thus suggested. Perhaps Descartes's education at La Flèche was to blame for not having elucidated the definition of life as *se movere*. For the expositors there were responsible for providing synthesis of the commentaries whenever needed.

Evidence for this hypothesis lies in two areas. The first area comprises Descartes's own texts and includes the French terminology he uses for the Latin words of the Conimbricenses and Toletus commentaries, his own description of nutrition, and his statements about the various Aristotelian senses of "motion."

It seems clear from Descartes's statements that he was trained in Aristotle by expositors who had the pedagogical fault of excessive reverence for technical terminology. As we have seen, he exclusively uses (self-) *mouvement* and *mouvoir* for "life" when describing the Aristotelian position. Since Descartes himself did not have a personal liking for arcane terminology, his usage indicates that he had learned Aristotle from people who simply transliterated the Latin *motus* into "motion" rather than translating it as "change."

Moreover, Descartes's discussion of nutrition in the *Description of the Human Body* is so similar to the Aristotelian explanation that it must be based on it; yet Descartes fails to identify nutrition with alteration, suggesting that the Aristotelian explanation on which it is based was faulty. Descartes says that "we should bear in mind that the parts of all living bodies which require nutrition to sustain them (that is, animals and plants) are continually in a state of change (*sont en continuel changement*)."[55] Notice, however, that although this comes close

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[53] See passages cited above.

[54] See passages cited above.

[55] Part Three ("Nutrition"); AT 247; CSM 1:319. The translation of *sont en continuel changement* is mine, replacing CSM's "are continually undergoing change."

to identifying nutrition with self-induced change (alteration), it falls short of doing so, insofar as "being in a state of change" is an insufficiently specific description of Aristotle's idea of nutrition, which, we have observed, is "being the efficient cause of" change in oneself. This certainly suggests that Descartes's Aristotelian masters did not make, or at least did not emphasize, a simple identity claim between "self-motion," self-nutrition, and self-induced change. Predictably, Descartes goes on to explain this *changement* as the local motions of fluid and solid particles in the body.[56]

Also of importance are Descartes's statements about the senses of "motion." Clearly he knew that scholastic philosophers asserted that *motus* had multiple meanings. In *The World*, he says that the scholastics had "a thousand" meanings for the term *mouvement*. But in this passage, he nevertheless asserts that "the only one he knows" is local motion: "I am not acquainted with any motion except . . . the motion which makes bodies pass from one place to another and successively occupy all the spaces which exist in between."[57] In the same passage he says that the scholastic statement of Aristotle's definition of motion from *Physics* 3.1, which uses the word *motus*,[58] is unintelligible to him. Descartes means by this that the other senses of motion are simply unintelligible; he is not saying that they are intelligible in themselves but he finds them too difficult to grasp. However, the distinction between undergoing change by inertial local motion, and causing change in oneself by self-induced alteration or activity, is not simply unintelligible. Aristotle's example of the ball makes the distinction quite clear and easy to understand. Thus Descartes's claim, if sincere, that the distinction is simply unintelligible would have to have been caused by obscurity in the explanations he received.

A second piece of evidence for the hypothesis that pedagogical faults contributed to Descartes's superficial treatment of "self-

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[56] Ibid.

[57] *The World*; AT 11:39–40; CSM 1:94. For difficulties in interpreting precisely what Descartes meant by "place" in the "ordinary vs. true" definitions of motion (both of which concerned local motion) in the *Principles*, see Gabbey, "New Doctrines of Motion," 657.

[58] "Motus est actus entis in potentia, prout in potentia est" for "hêi tou dunamei ontos entelecheia, hê toiouton, kinêsis estin"; *Physics* 3.1.201a10–11.

motion" is the state of philosophical education in Europe at that time. Although by 1550 in Paris philosophical instruction in Greek was underway and Greek editions of Aristotle were being printed at low cost for students, the trend had apparently not resulted in a deep understanding of Aristotle's texts by the time Descartes was a young man.[59] Fonseca had felt the need to initiate the Coimbra project in 1564 to put more students into direct contact with the mind of Aristotle, "deploring the prevailing situation in which all students of philosophy clamored to be taken as Aristotelian, with so few actually able to understand his words."[60] And we have seen that even the results of this project, published in 1592 and 1602, were not as clear on the concept of self-motion as they could have been.[61] It is not unlikely, then, that Descartes's teachers were unprepared to give an adequate exposition of the Aristotelian commentaries they were teaching.[62] As late as 1642, we have evidence of an enduring, commonplace use of technical terminology among scholastics: Descartes's letter to Fr. Dinet, referring to his condemnation by the professors at Utrecht, alludes to terminology which tended to *mask*, or *avoid talk of*, Aristotle's meaning, rather than to elucidate it: "one must demand . . . an explanation [of scholastic technical terms] from the books of those who use such terminology."[63]

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[59] Perhaps because of the ongoing contest and tension between humanism and scholasticism, on which see Brian Copenhaver and Charles Schmitt, *Renaissance Philosophy* (Oxford: Oxford University Press, 1992), 65–6. Elementary Greek was offered at La Flèche; Descartes lacked interest in it and quickly forgot it (see Rodis-Lewis, *Descartes*, 13).

[60] See Fowler, *Descartes on the Human Soul*, 193 n. 14. Similarly Des Chene: the purpose of these commentaries was to stabilize the interpretation of Aristotle ("Coimbra Commentaries," 30). For an overview of late Medieval and Renaissance Aristotelianisms, see Copenhaver and Schmitt, *Renaissance Philosophy*, 60–76.

[61] Thus in this case, Des Chene's praise for the Coimbrans ought to be tempered: "a Latinity purged of Scholastic barbarities . . . If Aristotelianism could have been renewed, here was its best opportunity" ("Coimbra Commentaries," 42).

[62] See also Copenhaver and Schmitt, *Renaissance Philosophy*, 60: "we have more than enough evidence of bad, dull, doctrinaire performance in early modern classrooms."

[63] "As if philosophy . . . should have to teach a terminology which it does not need! . . . [O]ne must demand . . . an explanation [of scholastic technical terms] from the books of those who use such terminology" (AT 7:597; CSM 2:394).

Certainly if Descartes had carefully read, reflected on, and synthesized various passages in the Aristotelian commentaries, and if he had pondered the association his teachers had apparently made between self-nourishment and change, he could have done much to avert his own superficial treatment of the notion of *se movere*. There seems to be some truth in a third hypothesis, then: Descartes himself was to blame; he failed to read carefully (or listen to) "the Aristotelians" whose account he hoped to improve upon.

So there are apparently three causes of Descartes's superficial treatment of *se movere*. Can we assign more weight to any one of the three? The texts of Descartes's objectors suggest that the principal cause was inadequate presentation of the material by the "Aristotelians" of the day.

Remarkably, his misinterpretation of *se movere* went unobserved by all of his contemporary objectors who addressed this question of the soul as life or self-mover: Gassendi, who in his own time was accounted one of the three greatest living philosophers (in the company of Descartes and Hobbes);[64] Mersenne, the theologian, philosopher, and mathematician who had been Descartes's schoolmate at La Flèche; Bourdin, a Jesuit and mathematician; Henry More, a "Cambridge Platonist" familiar with ancient and late antique philosophy, who described Aristotle's philosophy as "obvious";[65] and Fromondus, the Louvain philosopher and theologian.[66] In their objections to Descartes, none of them identified the weakness in his arguments that relied on "self-motion," and they gave no clear indication of knowing

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[64] See Craig Brush, *The Selected Works of Pierre Gassendi* (New York: Johnson Reprint Corp., 1972), vii. Below I follow Brush's translations where available, except as noted. My translations of texts not translated by Brush, and all Latin quotations, are from the *Opera Omnia* of 1658, which I cite by volume.

[65] Richard Ward, *The Life of Henry More: Parts One and Two*, ed. Sarah Hutton et al. (1710; Dordrecht: Kluwer Academic Publishers, 2000), 17–18.

[66] For a summary of objections to Descartes's account of animal souls in particular (and using other arguments based on alleged similarities between human and animal passions, intelligence, language, and imagination) by Pollot, Hobbes and Arnauld, see Fowler (*Descartes on the Human Soul*, 125, 128–30). Claude Perrault, writing in the second half of the century, gives a similar argument: the prudence and discretion of the movements by which animals shun or seek the harmful or advantageous are difficult to account for in Descartes's mechanistic philosophy (on Perrault, see J. Wright, "Perrault's Criticisms of the Cartesian Theory of the Soul," in *Descartes' Natural Philosophy*, 686 and following).

what Aristotle actually meant by this term. When they alluded to soul as life, they either failed to mention self-motion altogether, or mentioned motion without addressing its meaning, or referred to motion but identified it with local motion. These remarkable facts suggest a serious and pervasive weakness in the understanding of the Aristotelian definition of life in the faculties of the more prestigious educational institutions. Additional evidence for this theory comes from the philosophical texts of Gassendi and More, the two objectors with the most extensive and important philosophical corpora. Both Gassendi, who, like Descartes, sought to debunk the Aristotelian view that life required *anima*, and More, who desired to defend this traditional view, exhibit the same weakness in their grasp of "self-motion" that we found in Descartes.

Beginning with the authors of the *Objections to the Meditations* and taking them in order, we start with Gassendi. In his preface to the 1624 *Exercises Against the Aristotelians*, he tells Gaultier that while teaching Aristotle's philosophy at the Academy of Aix, "I always made it a point that my auditors should be able to defend Aristotle well."[67] And he sometimes distinguishes Aristotle from "Aristotelians," averring that the latter adulterated the former's ideas.[68] This would lead us to suppose that Gassendi had deep and thorough firsthand experience with Aristotle's texts. Yet he also says that "I was in no way required to make public [that is, publish] any of the points I put forth in defence of Aristotle [when I was teaching], for the voluminous works of the Aristotelians already fill the world . . . it [the Aristotelian position] is upheld more than adequately by Aristotelian authors."[69] Thus we are given pause, for we have already seen the danger of relying on the commentaries of, for example, the Conimbricenses and Toletus.

Indeed, Gassendi's handling of Aristotle has its faults. He sometimes shows himself to be unsure of the Peripatetic position,[70] or

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[67] Brush, 19.
[68] Brush, 23–4.
[69] Brush, 20.
[70] See *Syntagma*, pt. 2, sec. 1, bk. 4, chap. 8; Brush, 409: "The Peripatetics *appear* to hold this position (*videtur . . . sententia haec Peripatetica habenda*)" (emphasis added; Brush translation adapted). Contrast the confidence with which he summarizes for example, Alexander of Aphrodisias and the Stoics (ibid; Brush, 410).

leaves out important information.[71] And he gives the impression that his reading of Aristotle is superficial by giving mistaken citations for passages dealing with motion.[72]

Turning to texts in which Gassendi uses the concepts of self-motion, and motion generally, we note first that in the *Fifth Set of Objections* to the *Meditations*, Gassendi repeatedly alludes to Descartes's statements about the soul, life, and motion. When summarizing Descartes's account of his previously held belief that bodies lack the power of self-motion and that only souls possess it,[73] Gassendi says that it is unclear how Descartes can still maintain this,[74] since "[this] would imply that every body must by its nature be immobile, and that all its movements come from some incorporeal principle, and that we cannot suppose that water flows or an animal moves without some incorporeal movement."[75] Gassendi thus assumes that it is local motion that is relevant to the traditional claim that the soul is a source

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[71] In summarizing and rejecting Aristotle's argument that in a self-mover, the same part of the thing cannot be moved and moving at the same time in the same respect (*Physics* 8.5.257b10), Gassendi leaves out "in the same respect" (pt. 2, sec. 1, bk. 4, chap. 8; Brush, 420), which is emphasized by Aristotle. Gassendi's incomplete representation makes Aristotle's argument appear facile.

[72] He gives *Physics* 8.6 as the location of Aristotle's assertion that the same thing cannot be both mover and moved at the same time, which is not right; as Brush (420 n. 44) notes, it should be 8.5.257b (esp. 257b10). When reporting what is essentially the same claim, that Aristotle held that everything either moves (*kinein*) or is moved (*kineisthai*), Gassendi gives *Physics* 8.8 and *De Caelo* 2.2 as references (*Synt.*, pt. 2, sec. 1, bk. 4, chap. 8, p. 421), which is incorrect. As Brush again suggests (421 n. 45), Gassendi needs to cite *Physics* 8.5. Note that the strange citations are not limited to Aristotelian texts; *Phaedo* 94c–d seems irrelevant to Gassendi's point when he cites it at *Synt.*, pt. 2, sec. 1, bk. 4, chap. 8; Brush, 420.

[73] Second Meditation, cited above, section 1.

[74] Note that Gassendi's belief that Descartes "still" wants to maintain that bodies cannot move themselves is incorrect. Descartes had not asserted this at all; as he responds, "these were simply commonly held views which I was rehearsing so as to show in the appropriate place that they were false" (CSM 2:243; AT 7:351). Gassendi repeats this interpretation later in the same set of Objections: "Remember that you elsewhere denied that a body can move by itself, which implies that you are the cause of the movement" (CSM 2:237; AT 7:341).

[75] CSM 2:181; AT 7:260.

of motion.[76] He continues, again linking the soul's "motion" with local movements:

> You go on to say that, of the attributes ascribed to the soul, neither nutrition nor movement are to be found in you. . . . As far as movement is concerned, since it is you who cause your limbs (*membra*) to move, and they never assume any position unless you make them do so, how can this occur without movement on your part?[77]

Elsewhere in this passage, he does allude to the possibility of other senses of motion when he asks, "Why should you [the soul] not be in motion in many different ways?",[78] and when he says that "exertion" (*contentio*) implies mobility.[79] Yet we are given nothing more specific than this. When later giving the traditional definition of a human soul later in this work, Gassendi uses "motion" exclusively for the local motion of a human being *in toto*: "the internal principle by which a man lives, has sensations, moves around (*loco movetur*) and understands,"[80] and the only other reference he makes to the soul as a mover occurs when he tells Descartes that he interprets "motion" to mean "thinking."[81] Thus Gassendi's 1641 treatment of passages in which Descartes denies that the human soul is the cause of the body's self-motion (life) focuses on bodily movements, and it is vague about any other sort of motion a soul would cause besides locomotion or thought.

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[76] For Gassendi's own assertions that at least some matter is active, not inert, and that soul is corporeal (mobile atoms), see *Synt.*, pt. 2, sec. 1, bk. 4, chap. 8; Brush, 416–7, 420, 422–3, 431.

[77] CSM 2:182; AT 7:261. Gassendi is here addressing Descartes as a soul—since he claims to accept, for the sake of argument, Descartes's supposition that he has no body.

[78] "Cur non moveri pluribus motibus?" (CSM 2:182; AT 7:261).

[79] In contrast to being "at rest" (*non moveri*; ibid). "For, given that you move many of your limbs, how could you accomplish this unless you were in motion yourself? You certainly cannot be immobile, since exertion is required when you move your limbs, nor can you be at rest if you are to produce movement in the body." This is repeated later: "You must explain to us how 'directing' of movement can occur without some effort (*aliqua tui contentione*)—therefore motion—on your part" (CSM 2:237; AT 7:341).

[80] CSM 2:183; AT 7:263.

[81] He refers to "those noted philosophers who, to prove that we are immortal, assume that we are in perpetual motion or, as I interpret it, that we are perpetually thinking" (CSM 2:184; AT 7:264). Compare *On the Soul* 1.3.407a20; Aristotle, summarizing (and disagreeing with) Plato, says that mind's movement is thinking.

Later texts reinforce the impression that Gassendi was unaware of the meaning or implications of Aristotelian "self-motion." In the 1642 *De Motu*, Gassendi makes clear that he is aware that Aristotle posited multiple species of "movement." Like Descartes, he favors the view that all qualitative change can be explained by inertial local motions of particles,[82] although he offers no argument for this position besides an argument from authority.[83] What is more striking and important, however, is that in statements where he links life with motion, rather than indicating awareness of the sense of "motion" intended by Aristotle and denying that alteration is distinct from local motion, he guilelessly identifies this motion with local motion, as if accurately reporting the ancient idea.

Thus he asserts of Aristotle that "in the movements of animals he thought the parts should be distinguished, some of which were moved by others, until that one [part] which moved, itself being unmoved [namely, the soul]."[84] We infer that he understands the moved "parts" as limbs;[85] for when he goes on to allude to the ancient idea that life, self-motion, is cyclic (a claim by which Plato referred to fertility cycles[86]), an erroneous literalism reveals itself:

> No motion can be executed by an animal which is simply straight; a man, for instance, cannot trace a straight line with his finger or pen except through the combination of several circular movements at once.

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[82] "There is no motion that cannot be considered natural inasmuch as there is none that does not result from the fundamental particles of things, particles whose nature was willed by their author to include forever a principle of motion by which they could move. And this would seem to be the reason why they are mixed together in different ways and create different sorts of things which act variously among themselves and are acted upon, or move and are moved" (*De Motu*, First Letter; *Opera Omnia* 3:488, right col.; Brush, 126).

[83] "Every transformation by which . . . qualities come into being appear to be nothing more than certain local motions in which the fundamental particles of things, although very tiny and imperceptible, mix in different ways. . . . Such, at least, according to Sextus Empiricus, was the opinion of famous philosophers who held that such changes were no more than certain kinds of local motion against Aristotle, who defended the position that they were distinct from local motion" (ibid.).

[84] "in motibus animalium distinguendas censuerit parteis, quarum aliae moverentur ab aliis, ad usque unam, que moveret, per se immota" (*De Motu*, First Letter; *Opera Omnia* 3:488, left col.; my translation).

[85] So Brush, 126. These passages are separated by a few paragraphs, but Gassendi refers back to this one when he begins the second of the two.

[86] *Republic* 546a.

> . . . Also, consider the spontaneous motion of the arms as you walk in a hurry; their center is the shoulder blade . . . and the movement of the leg, whose center is the hipbone."[87]

As we have seen, this crude model is far from what Aristotle intended when he argued that the soul is the unmoved mover (principle of life) in an organism.[88]

Similarly, in the book on plants of the 1658 *Syntagma*, Gassendi sets out to defend the view of Epicurus that plants do not have souls. He raises the Aristotelian objection:

> But yet, you say, are not plants said to live and die? Therefore there is life in them. And if we first conceded life [to them], must not *anima* also be conceded to them, without which life cannot be made sense of? And anyway, isn't nutrition itself the action of life, and [didn't] Aristotle rightly contend that nothing without *anima* (*aneu psuchês*) is nurtured?[89]

Gassendi's response rests on an etymological "argument" based on the similarity between *animalis* and *anima*: if we attribute *anima* to them, there is nothing to prevent us calling them "animals," which is

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[87] "Non posse ullum motum ab animali exseri, qui simpliciter recus fit; neque hominem v.c. ducere posse digito, aut stilo rectam lineam, nisi pluribus motibus circularibus compositis simul. . . . Considera quoque ut inter expedite ambulandum, spontaneus ille bracchiorum motus, cuius centrum scapulae sunt . . . ac motus crurum, cuius centrum coxendices" (*De Motu*, First Letter; *Opera Omnia* 3:488, right col.; Brush, 128).

[88] Gassendi's account of cyclical bodily movements may be due to a misapplication of *On the Soul* 1.3.406b26 and following to the case of individual *animae*. The *DA* passage summarizes *Timaeus* 35 and following. In it Aristotle argues against Plato's depiction of the world-soul as having movements that are to be identified with the circular local movements of the heavenly bodies. *Physics* 8.8–9 may also be relevant, since Gassendi's comments throughout this chapter seem to be derived from or directed at *Physics* 8 (for example, he disagrees with Aristotle's distinction between natural and violent motion and alludes to celestial motions). In 8.8–9 Aristotle argues that since the universe must be infinite, single, and continuous in motion, the local motions (paths) of celestial bodies must be rotary rather than rectilinear, and rotary motion must be the primary locomotion in the universe.

[89] *Synt.*, pt. 2, sec. 3, bk. 4, chap. 1; *Opera Omnia* 2:145, left col.: "Attamen, inquies, nonne plantae vivere, et mori dicuntur? In iis igitur vita est; et, si vitam semel concessimus, none simul erit concedenda anima, sine qua non potest intelligi vita? Et, nonne ipsa saltem nutritio vitae action est, beneque Aristoteles nihil *aneu psuchês* sine anima nutriti contendit?" I am interpreting the *Opera Omnia* to intend *aneu*, given the parallel *sine*. The text itself is very unclear in the final two letters of the word; it is also unclear exactly which text (or secondary author) Gassendi has in mind when he attributes this phrase to Aristotle.

absurd, for they are not animals but plants.[90] Thus it is clear from language that *anima* can in no way be attributed to plants.[91] He denies that plants are actually alive (since only animals have *anima*); and interestingly, when he allows that plants may have life "analogously," we see him associate life with "faculty of motion," but give examples of local motion:

> It can be responded [to the Aristotelian challenge] that indeed properly [speaking] life does not exist without *anima* [and so strictly speaking, only animals are alive]; but nevertheless it [life] may be attributed [to plants], as to other things, by a sort of analogy. For certainly life, according to the more general notion, is nothing other than a certain enjoyment of vigor, and of active faculties of motion, just as death is the extinction of these. For in this way [namely, analogously] fire, when it is inflamed, is said to live, but when it is stifled, to die. In the same manner water, so long as it gushes forth, and flows, we call living, but when it is stagnant, 'dead.' And similarly, [we say that] a color which gleams forcefully [is] alive, [that] one which does not strike our sight, [is] 'dead.' In the same manner [we say that] a magnet, in which is the power of drawing iron, is 'live,' one in which this power has disappeared [is] 'dead.' . . . Therefore also the faculty of nutrition itself, even [the power of nurturing] from the inside, can be regarded as more general than [that which is] attributed to soul alone; so that whatever indeed has *anima*, is nurtured; but not everything that is nurtured has *anima*.[92]

The above shows that Gassendi knew that the accepted (Aristotelian) definition of life included "faculty of motion," that soul was supposed to be the cause of this faculty,[93] and that soul was supposed to be the cause of "nutrition from the inside" (that is, self-nutrition). However, he does not appear to have known that Aristotle intended nutrition to be identical to the faculty of (self-)motion. He mentions vigor and capacity for mobility as two separate items, using the plural demonstrative: "death is the extinction of these" (*earumdem*). Thus I

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[90] *Synt.*, pt. 2, sec. 3, bk. 4, ch. 1; *Opera Omnia* 2:144, right col.

[91] Ibid.

[92] Ibid. 2:145, left col.: "Responderi potest, vitam quidem proprie non esse sine anima; sed eam tamen, ut aliis rebus, sic posse et plantis ex analogia quadam attribui. Vita quipped, generaliore notione, nihil aliud est, quam usura quaedam vigoris, mobilitatisque facultatem activarum, ut mors est earumdem extinctio. Sic enim ignis, dum flammescit, vivere dicitur; dum vero suffocatur, mori. Sic aquam, donec scaturit, fluitque, vivam dicimus; dum immota est, restagnatque, mortuam. Sic et colorem vividum, qui vehementer radiat; mortuum, qui visum non percellit. Sic magnetem vegetum, in quo est ferri trahendi vis; mortuum, in quo vis illa evanuit. . . . Heinc facultas quoque ipsa nutritionis, etiam ab intrinseco, censeri potest generalior, quam ut attribuatur soli animae; adeo ut, quicquid animam quidem habet, nutriatur; sed non quicquid nutritur, habeat animam."

take it that the examples he gives are intended to fall into one or the other of these categories—bright color into "vigor" and fire, water, and magnets into "faculty of motion." It becomes clear, then, that Gassendi believed the latter to be the faculty of either exhibiting local motion oneself or causing local motion in another thing: water gushes and flows, fire flickers and flames upward and outward, magnets move iron bits. Thus he, like Descartes, misses the meaning of the "self-motion" which he occasionally employs.

What Gassendi says about nutrition elsewhere in this work shows a lack of philosophical reflection on this phenomenon. Without argumentation (but citing the authority of Epicurus' letter to Herodotus), he asserts that nutrition and growth are qualities that "originate" (*procreari*) from the addition of new atoms to a thing,[94] and can be fully explained as addition of matter to the thing.[95] Thus rocks have nutrition and grow.[96] This fails to address the difference, pointed out by Aristotle, between mere addition and assimilation.[97] When Gassendi elsewhere gives *operatio*, *moliri*, and *agere* as synonyms for *vita* and

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[93] Gassendi also associates soul with self-motion when allowing for the possibility that the world has a corporeal soul, which is heat. He says, "such a principle, even as it creates itself, compels the body in which it resides to move itself (*dum seipsum creet, compellat corpus in quo est, ut moveatur ipsum*)" (*Synt.*, pt. 2, sec. 1, bk. 4, chap. 8; *Opera Omnia* 2:334, right col.; Brush, 412–13). He uses this definition in his ensuing argument, holding (against Aristotle) that vegetative and sensate faculties would require a soul that is corporeal (not incorporeal), and again seeming to interpret self-motion as the local motions of limbs or of the human body *in toto* ("Quod anima autem humana incorporea cum sit, et in ipsum tamen corpus suum agat, motumque ipsi imprimat; dicimus suo loco animam humanam, qua est intellectus, sev mens, atque adeo incorporea, non elicere actiones, nisi intellectualeis sev mentaleis, et incorporeas; et qua est sentiens, vegetans, praeditaque vi corporum motrice, atque adeo corporea est, elicere actions corporeas, actum corpus proprium, tum ipsius quoque interventu alienum movere"; ibid.).

[94] *Synt.*, pt. 2, sect. 1, bk. 5, chap. 7; Brush, 433.

[95] Among the changes (*mutationes*) which can be explained (*possunt explicari*) by addition of new parts (*accessione novarum, per accessionem*) is *nutritio* (*Synt.*, pt. 2, sect. 1, bk. 5, chap. 7; *Opera Omnia* 2:371, right col.; Brush, 433).

[96] "Indeed plants therefore are called *phuta*, that is, *nata* ['born'], 'specially,' as if in a certain special way, in the way that stones, and other things are born, and in the same way [have] nutrition for themselves, and increase in size" (*Synt.*, pt. 2, sec. 3, bk. 4; *Opera Omnia* 2:145, left col.).

[97] Examples of the former include putting an addition on a house, or the "growth" of crystals. Assimilation is distinct, of course, because it is the conversion and incorporation of matter. The distinction is described by Aristotle in *Metaphysics* 5.4.1014b23 as "contact" versus "growing together."

motio,[98] we see that they are for Gassendi merely names for the inertial local motions of tiny particles in a body: growth, diminution, and other such "qualities" are "created" when these particles crash against one another.[99] Thus Gassendi's physics, like Descartes's, fails to explain why metabolism occurs in some things but not others, given that all material objects have moving particles.

Mersenne praised the Jesuits of his own century for their learning and profound knowledge,[100] yet his training with them did not equip him to provide a philosophical defense of souls as life principles, despite his desire to do so in the *Sixth Set of Objections* to the *Meditations*. He and his colleagues state that they are unwilling to accept Descartes's account of living things, but they give no reason why not:

> So far are we from accepting that all their [animals'] operations can be satisfactorily explained by means of mechanics, without invoking any sensation, life, or soul, that we are willing to wager anything you like that this is an impossible and ridiculous claim.[101]

Descartes quite rightly responds that "these remarks should not be taken to constitute an argument . . . indeed, the use of wagers in debate is only resorted to when there is a lack of arguments to prove the case."[102]

One year earlier, in a 1646 letter to Huygens, Mersenne came closer to pinpointing a real problem with Descartes's account when he expressed his disbelief that soul is unnecessary for explaining the "movements" of plants and animals:

> Do you think that Regius explains the movements (*mouvements*) of plants and animals without giving them souls, as the principles of Descartes seem to require? I do not believe that it can be done, for the passions and affections of a single dog would require an extraordinary multitude of springs of action (*une estrange multitude de ressorts*) to be able to be performed without a soul. And I am convinced that you are of my opinion.[103]

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[98] *Synt.*, pt. 2, sect. 3, bk. 13; *Opera Omnia* 2:583, left col.

[99] See ibid.; *Opera Omnia* 2:583, right col.–584); with pt. 2, sect. 3, bk. 4; *Opera Omnia* 2:162, for example, "intelligitur . . . ea corpuscula, ex quibus substantia componitur, qualitates istas creare, prout isto, aliove modo moventur; insinuantur, apllicantur."

[100] *Harmonie Universelle*, 24, cited in Peter R. Dear, *Mersenne and the Learning of the Schools* (Ithaca: Cornell University Press, 1988), 224.

[101] AT 7:413; CSM 2:279.

[102] Replies to the Sixth Set of Objections, AT 7:426; CSM 2:288.

While this passage is difficult to interpret given its brevity,[104] it is safe to say that even it offers us no conclusive evidence that he had seen the problem with Descartes's account of self-motion. For Mersenne's claim is that these passions and affections require either a soul or an extraordinary multitude of "ressorts." That is, if the body had the necessary number or complexity of supporting organs or activities, then the soul would be unnecessary. Thus Mersenne misses the real weakness in Descartes's arguments because he does not know what philosophical purpose is served by Aristotelian soul. The philosophical

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[103] Mersenne to Huygens, *Correspondance du P. Marin Mersenne, religieux minime* 14:496–7; trans. Fowler (*Descartes on the Human Soul*, 150) adapted. "Croyez vous que le Sr Regius explique les mouvements des plantes et des animaux sans leur donner des ames, comme il semble que veulent les principes de Mr des Cartes? Je ne croy pas qu'il vienne à bout, car les passions et affections du seul chien auroit besoin d'une estrange multitude de ressorts pour pouvoir ester faites sans ame. Et ie m'assure que vous estes de mon sentiment."

[104] The best case that can be made for Mersenne requires taking him to intend the technical philosophical senses of the Latin cognates of *passions et affections*, and also to intend *ressorts* in the figurative sense of "cause agissante: énergie, force (généralement occulte) qui fait agir, se mouvoir" (see *Le Nouveau Petit Robert* [1958; Paris: Dictionnaires Le Robert, 1994]). The Latin *affectio* was used in classical and scholastic Latin for Aristotle's "disposition" (*diathesis*), namely, a qualitative condition that is easily changed (see Aristotle, *Categories* 8). The Latin *passio* often corresponded to Aristotle's *pathos*, meaning a condition that has been induced by a cause that may easily be rendered ineffective (see ibid.). Since Aristotle discusses disposition and passion under the heading of quality (though a passion is not properly speaking a quality), Mersenne could be coming close to identifying the problem of explaining qualitative change in a live organism. It is not obvious from the text, however, that he intends this; hence Fowler translates "actions and reactions" (*Descartes on the Human Soul*, 150). Moreover, it is not clear when the figurative sense of *ressort*, which is also needed for the best-case interpretation, became current. *Le Nouveau Petit Robert* assigns it to the sixteenth century but gives only Montaigne's phrase, "je ne sais guère par quels ressorts la peur agit en nous" as evidence. The first time this meaning begins to enter historical dictionaries is in the *Dictionnaire de L'Acadèmie française*, 6th ed. (1832–35), which gives "Activité, force, énergie" (see this and earlier dictionary entries on ARTFL, http://colet.uchicago.edu/cgi-bin/dicollook.pl?strippedhw=ressort). The primary meanings of *ressort* in the seventeenth century were a "spring" used in a machine, and a juridical sense which is not relevant here. Thus Fowler seems on the whole correct to translate *un estrange multitude de ressorts* as "an extraordinarily complex network"; presumably a reference to "a complex network" is understood by taking "multitude de ressorts" to refer to many springs of action or change which operate according to some pattern, where the grounds of activity are organs arranged in a complex fashion. (I received helpful comments from Steve Maddux on the translation of Mersenne's *une estrange multitude de ressorts*.)

role of soul is not to supplement an insufficient quantity of motions which the body produces of its own accord, or to add an element of complexity to insufficiently complicated changes or states which the body produces or undergoes of its own accord. Rather, it is to account for the fact that some material bodies engage in the self-induced alteration which is nutrition, despite the fact that they may be structurally far less complex than others which do not do so (such as complex artefacts). Aristotle would point out that it is observable that a body, qua body, is unable of its own accord to produce any change in itself.

Pierre Bourdin, a Jesuit teacher of mathematics in Paris, alludes in the *Seventh Set of Objections* to Descartes's report that "according to my [former, Aristotelian] judgment the power of self-motion . . . was quite foreign to the nature of a body."[105] But Bourdin's treatment of this passage from the Second Meditation gives no indication that he understood why Aristotle would make such a judgment. Instead, he questions Descartes's definition of "body," focusing on the fact that Oviedo (a Spanish Jesuit) and others were open to redefining "body" to include "virtually extended" and indivisible things. When Bourdin again quotes Descartes's statement of what he formerly understood by "soul," in section four, he similarly directs all his comments to the question of the soul's incorporeality, arguing that Descartes has not sufficiently proven it.[106]

Henry More, who had enthusiastically immersed himself in the Cambridge philosophy curriculum at a time when it was dominated by Aristotle,[107] also objected to Descartes's account of soulless life. In 1648 he accused Descartes of "withholding life" from animals because the latter denied that all living things had souls; he objected that Descartes "would never concede that they really live."[108] Yet in this letter More says nothing very philosophical concerning the relation between life and soul. He says only that his spirit reacts from "sensitivity and tenderness" against the "cruelty" and "murderous sentiment" by which Descartes "dared to despoil of life and sense practically the whole race of animals, metamorphosing them into marble

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[105] AT 7:26 and 9:20; CSM 2:18; see above.

[106] CSM 2:327–9; AT 7:485–7.

[107] See Ward, Hutton, et al., *The Life of Henry More*, 17; for the curriculum of Cambridge, see ibid., 17 n. 16.

[108] AT 5:243 (Letter 531, 11 December 1648; trans. Cohen, 50).

statues and machines," adding that "such a position, hardly harmonious with the phenomena of nature, plainly is unheard of until now."[109] Apart from the undefended reference to the "phenomena of nature," this objection reduces to a sort of loyalty to the classical notion of soul as life-principle, coupled with an aesthetic abhorrence of mechanism and a sentimentality about animals; he offers Descartes no explicit reason to think that the mechanistic understanding of life is inadequate. Descartes simply responds by saying that he does not withhold life from animals, but rather that it consists in the heat of the heart.[110] More writes a long letter back,[111] but offers no response to this rejoinder.

More's own philosophical works make it plain that he was sympathetic to ancient philosophy, and not unfamiliar with Aristotle.[112] Moreover, of all Descartes's objectors, he came the closest to describing accurately the ancient concept of life. Nevertheless, these works suggest that his understanding of "self-motion" remained incomplete, insofar as he persisted in thinking that "motion" referred to local motions in a body. Although he sometimes connects activity or alteration with motion, he never simply identifies these with motion in the case of "self-motion."

In the 1659 *Immortality of the Soul*, More argues that there is such a thing as an immaterial soul. We might expect him to make use of Aristotle's distinction between self-motion and the suffering of motion as a way to advance his claim that matter alone cannot account for life. During the course of several arguments, he does rely upon a conjunction of the concepts of "motion" and "soul." Yet the motion he alludes to is local.

Thus when arguing that the soul cannot be located in the conarion alone, he asserts that the "plastick power" of the soul—the lowest faculty of the soul, in which man differs little from a plant[113]—sets up

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[109] AT 5:245; Cohen, 51.

[110] AT 5:278 (Letter 537, Feb. 5, 1649); my translation ("vitam enim nulli animali denego, utpote quam in solo cordis calore consistere statuo").

[111] AT 5:298–317, esp. 309–11 (Letter 544, 5 March 1649).

[112] For example, he assumes Aristotle's hierarchy of three types of souls (vegetative, sensate, rational), and makes use of the argument for the necessary existence of a self-mover (*Immortality*, bk. 1, chap. 6, axiom 16; *The Philosophical Writings of Henry More*, ed. Flora MacKinnon [New York: AMS Press, 1969], 74). All page numbers below are to MacKinnon.

[113] See *Enthuiasmus Triumphatus* (published 1656), sec. 4, where this is called "the vegetative or plantal faculties."

"motions" in the body; yet these are local motions similar to those mentioned by Descartes (and Regius after him): the systole and diastole of the heart, the reciprocation of the animal spirits. He asserts that these could not be perpetual if "some more mystical principle than what is merely mechanical did not give assistance,"[114] rather than arguing that "motion" in the sense of alteration/nutrition requires souls as its cause. Elsewhere we are told that brutes must have souls because "spontaneous motion," which More uses as synonym for "internal motion"[115] (compare the Conimbricenses' and Toletus' *intrinsecus motus*), cannot be explained by the conarion[116] of the brain or by the valves of the nervous system. But his reasoning is that the motions of running, striking, and thrusting require more force and strength than this gland can communicate through the animal spirits.[117] He thus mixes up *intrinsecus motus* with locomotion of a body *in toto*; these are two different categories in the ancient tradition which More takes himself to be defending. Moreover, in texts where we do find a convergence of the terms "motion" and "life," the two are not identified, nor is their relation spelled out.[118] Again, when More makes use of the traditional idea that spirit has self-motion unlike matter which does not, this is explained in spatial terms: "the power of contracting and dilating itself."[119] (More maintains this by asserting that "all immaterial beings are in some way extended."[120]) He unequivocally reduces alteration in the body to local motion of matter: a necessary *consequence* of spirit's power to move particles of matter locally is its power to alter matter.[121] Throughout the book he exhibits a general tendency to understand "motion" as local motion.[122]

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[114] *Immortality*, bk. 2, chap. 10, axiom 3; MacKinnon, 147–8.

[115] *Enchiridion Metaphysicum*, 9.15; MacKinnon, 263.

[116] Pineal gland.

[117] *Immortality*, bk. 2, chap. 5, axiom 3; MacKinnon, 133.

[118] Perception, life, and motion are repeatedly listed as three different things (*Enchiridion Metaphysicum*, sec. 17; MacKinnon, 206 and 207); we hear of the "natural power of life *and* motion" (*Immortality*, bk. 2, chap. 15, axiom 5; MacKinnon, 144, emphasis added); "life *and* the faculty of moving . . . life . . . *also* the faculty of moving" (*Enchiridion Metaphysicum*, sec. 18; MacKinnon, 209, emphasis added); and More's definition of a spirit is "an immaterial substance intrinsically endued with life *and* the faculty of motion" (*Enchiridion Metaphysicum*, sec. 18; MacKinnon, 207, emphasis added).

[119] *Immortality*, bk. 1, chap. 7, axiom 4; MacKinnon, 80. Compare bk. 1, chap. 8, axiom 7; MacKinnon, 85.

[120] *Enchiridion Metaphysicum*, sec. 5; MacKinnon, 188.

[121] *Immortality*, bk. 1, chap. 7, axiom 6; MacKinnon, 82.

More comes closest of all Descartes's objectors to clearly articulating the ancient concept of life when he refers to a power of "self-activity" in the 1668 *Divine Dialogues*. He describes this as "an active power in a spirit, whereby it either modifies itself according to its own nature or moves the matter regularly according to some certain modifications it impresses upon it."[123] This definition is somewhat noncommittal, but it shows awareness of a distinction between self-alteration and local motion; it allows for the Aristotelian view that local movements of material are a consequence of the soul's act of inducing alteration. We note, however, that More does not present self-activity as simply synonymous with "self-motion." The word "moves" is used of matter, and given his earlier descriptions of the "motions" which souls set up in bodies, the movement he has in mind seems to be local. Indeed, subsequently in the 1671 *Enchiridion Metaphysicum*, spirit's "immediate property is activity" in the sense of "pervading or dispreading motion" in a body. Thus we are again left with the sense that More does not realize that the ancients maintained a real distinction between self-motion and local motion.[124] The meaning of the term "self-motion" is not clear to him.

Finally, Fromondus objected to Descartes's comparison of animals to machines and his replacement of nonrational soul with heat; but he, too, did not recognize Descartes's misapplication of Aristotelian "self-motion." In his letter to Plempius regarding the *Discourse*, he concerns himself with sensitive souls of brutes rather than the concept of life, remarking only that "such noble operations" as seeing and hearing "*do not seem to be able* to proceed from such an ignoble and

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[122] We find: there is motion in the world; matter is not self-movable; therefore matter received a certain quantity of motion at the moment of its first creation by God (*Immortality*, bk. 1, chap. 11, axioms 2–9; MacKinnon, 97–102). This sounds very much like Descartes's earlier account of the inertial local motion of minute particles, and shows no awareness of the import of Aristotle's claim that souls are "movers" of bodies. In another argument we hear that matter cannot sense, and that sense is motion (a claim made by Aristotle in *On the Soul* 2.4.415b23–5, where motion again means alteration). Here "sense" is said to be identical with "communication of motion"; but the motion alluded to is local, that is, "the many windings and turnings that must happen to the transmission of this motion, which are likely to be as so many refractions or reflexions" (*Immortality*, bk. 2, chap. 4, axiom 2; MacKinnon, 128–9; compare 2.4.8; MacKinnon, 130).

[123] *Divine Dialogues* 2; MacKinnon, 264.

[124] Ibid.

insensitive cause" as the sort of heat that is found in heated hay.[125] His next objection to Descartes's statement that there is no difference between a real animal and an automaton with the internal organs of an animal, is puzzling: "What need is there, then, to insert a substantial soul into brutes, if the heat of hay suffices for the operations of the internal and external senses and of appetite?"[126] It is unclear whether he means that Descartes is being inconsistent when he continues to speak of brute souls,[127] or whether Fromondus himself is trying to say that substantial animal souls are worth salvaging (without giving any reason why they should be).[128] Fromondus's only other argument is consequentialist: as a result of Descartes's equating live brute animals with machines, "perhaps the way may be made smooth for atheists, so that they also attribute the operations of the rational soul to a similar cause, and exclude it [rational soul] from the human body, or at least cram a material soul into us in exchange for an immaterial one. Such elevated operations should not be attributed to such a lowly cause."[129]

IV

Conclusions. The arguments whereby Descartes sought to debunk Aristotelian vegetative soul rely upon a mistaken sense of "motion." Moreover, among Descartes's contemporary objectors, neither Gassendi, who like Descartes attacked the Aristotelian view that life required *anima*, nor any of the others, who desired to defend this traditional view, gives us any indication of having understood what Aristotle meant by "life is self-motion." All of this serves as evidence that in the early seventeenth century, what passed for competence in Aristotle was, as John Cottingham has said in another context, "re-

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[125] 13 September 1637, point 1; AT 1:403, emphasis added (*non videntur posse prodire*). Translations of Fromondus are my own.

[126] Ibid., point 2: "Quid igitur opus animas substantiales brutis inserere, si calor foeni sufficiat ad omnium sensuum internorum, externorum, et appetitûs operationes?"

[127] Compare *Discourse*; AT 6:58, 59.

[128] If this is the case, the term "substantial souls" (*animas substantiales*) is surprising, since neither Aristotle nor Aquinas accepted that the souls of animals are substances; Fromondus would presumably be using it because animal souls are (according to the tradition) the forms of animals, which (animals) are substances (that is, animal souls are 'substantial forms').

[129] 13 September 1637, point 2.

spect for authority and skill in jargon-manipulation,"[130] rather than deep assimilation and clear articulation of central philosophical concepts. That is unfortunate in this case. For, subsequently, the intriguing explanatory power of the ancient definition of life became increasingly overlooked.[131]

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[130] John Cottingham, *Descartes* (Oxford: Basil Blackwell, 1986), 5.

[131] I received helpful comments from Arthur Madigan, S.J. on an earlier version of this article.