Aristotle on Life edited by John Mouracade

APEIRON 41.3. Kelowna, BC: Academic Printing and Publishing, 2008. Pp. x + 197. ISBN 978–0–020980–97–2. Paper $28.95

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In a famous passage from the *Parts of Animals*,[1] Aristotle encourages his students not to shy away from the study of even the least attractive of animals, because—quoting the words from Heraclitus—'there are gods here too.' Unfortunately, it has taken Aristotelian scholarship many centuries to take his advice. It was not until a few decades ago that scholars started to see the importance of Aristotle's investigations of life, both for their own merits (Aristotle is the first to study living beings in a scientific manner and is also the founder of philosophy of biology) and for their pervasive influence on Aristotle's philosophy, in particular his philosophy of science and metaphysics [see, e.g., Gotthelf and Lennox 1987, Devereux and Pellegrin 1990, and Lennox 2001a].[2]

[1] *Parts of Animals* 1.5.645a7–23:

> For even in the study of animals disagreeable to perception, the nature that crafted them likewise provides extraordinary pleasures to those who are able to know their causes and are by nature philosophers.... For this reason we should not be childishly disgusted at the examination of the less valuable animals. For in all natural things there is something marvelous. Even as Heraclitus is said to have spoken to those strangers who wished to meet him but stopped as they were approaching when they saw him warming himself by the oven—he bade them enter without fear, 'for there are gods here too'—so one should approach research about each of the animals without disgust, since in every one there is something natural and good. [trans. Lennox, 2001b]

[2] For this development, the works of David Balme, Robert Bolton, David Charles, Allan Gotthelf, Wolfgang Kullmann, James G. Lennox, G. E. R. Lloyd, and Pierre Pellegrin may be singled out as having been of particular importance.

ISSN 1549–4497 (online) ISSN 1549–4470 (print) ISSN 1549–4489 (CD-ROM)
Aestimatio 6 (2009) 127–138

The collection of seven papers brought together by John Mouracade in this special volume of *Apeiron*—which originated in the conference 'Aristotle on Life' convened at the University of Alaska in August 2007—continues this fairly recent re-appreciation of Aristotle's study of life. Its central aim is to display the unity underlying Aristotle's treatment of life by combining two approaches, one physical and the other metaphysical, to this issue, thereby collectively contributing to our understanding of Aristotle's 'ontology of living beings'.

In the introduction to the volume, Mouracade promises us an interesting, important, and thought-provoking set of papers. Overall, readers will find that the collection lives up to that promise. Each of the papers defends a radically new interpretation of some aspect of Aristotle's study of life, many of which I expect to generate considerable discussion in the field. In addition, there is a noticeable effort—perhaps strongest in Mouracade's own contribution to the collection—to make Aristotle's ideas about life relevant to modern philosophers and scientists, which makes the collection of potential interest to a larger audience. (Note that all the primary texts in this volume are offered in translation and that the use of Greek is relatively sparse). And finally, some of the authors raise methodological problems concerning the interpretation of Aristotelian texts, and their proposed solutions ought to be of relevance to all scholars of Aristotle. (For instance, Julie Ward theorizes about how to reconcile different texts within the Aristotelian corpus and whether one ought to postulate extra-theoretical claims in order to explain away inconsistencies [78–79].)

As is common with edited volumes of this type, the volume is less successful when viewed as a unified collection. The introduction offers no further theoretical background on the central theme of the papers, nor is it always clear how some of the papers contribute to this theme. On a few occasions, the authors make conflicting claims (for instance, Devin Henry and Margaret Scharle present opposing views on the question of whether for Aristotle material-efficient causes can operate independently of formal-final causes) or discuss similar texts (Aristotle's account of inheritance in *Generation of Animals* 4.3, for instance, plays a key role in the arguments of both Henry and Katayama): it would have been interesting to see more explicit interaction between the contributors in their papers.

The first paper, by Paul Studtmann, offers a conceptual analysis of Aristotle's notion of form (εἶδος). Studtmann starts off with an overview of the difficulties in Aristotle's characterizations of form in *Meta.* 1013a27–29 and 1013b20–25, followed by a six-page list of examples of the meanings of 'form' occurring in Aristotle's *Metaphysics*. The list illustrates Studtmann's general claim that there are 'bewilderingly many uses of "form" in Aristotle' [3]; but it is not entirely clear how the reader is supposed to evaluate these examples, as many are quoted out of context and do not appear to be examples of meanings of 'form' at all (surely, 'form' does not *mean* 'art', or 'a this', and so on).[3]

From this list, Studtmann selects 14 central meanings of 'form' and reduces these meanings to two basic conceptions: just as Aristotle distinguishes between the subject (ὑποκείμενον) as 'composite of form and matter' and the subject as 'matter', so too we are urged to assume that he distinguishes between the form as the form of a composite ('form-c', being a universal) and the form as the form of matter ('form-m', being a particular). Studtmann illustrates the form-m by reference to Aristotle's conception of the soul as a capacity (a conception which Studtmann takes to be of a particular form) and to the pairs of contrary capacities characterizing the four sublunary elements (where the matter that is being informed is—rather controversially—understood to be prime matter). Both souls and contraries are sources of the dynamical activities of the composite they inform, which makes form-m a form that informs matter, a particular, and a capacity-like entity that is a source of activities. Form-c is—without further argumentation—identified with Aristotle's concept of species. The relation of form-m and form-c is then characterized as one of functional determination: form-m is that which is necessary and sufficient to make something a member of a certain species, which is form-c.

Studtmann's next move is to group the 14 meanings of 'form' under these two basic concepts, and he finally concludes that both concepts fall under the general genus of order. This conclusion is

[3] I found some of the translations confusing: for instance, Studtmann translates οὐσία in *Meta.* 1013a27 as 'essence' [2]; but in his list of examples 'essence' translates τό τι εἶναι, whereas 'substance' is used to translate οὐσία [3–8].

not so much argued for (nor supported by any textual evidence), but rather, as Studtmann concedes, inferred from 'plausible interpretative assumptions' [26]—the plausibility of which is simply assumed as well. However, it is not certain that many readers will agree; without further argument, I do not find Studtmann's final taxonomy of form to be convincing.

In the second paper, Margaret Scharle argues in a very illuminating way that Aristotle's defense of natural teleology does not just pertain to living organisms but also to all natural phenomena, including the operation of the four sublunary elements. This means that for Aristotle, '*all* material and efficient causation in nature depends on formal and final causation' [29], and that this is ultimately the source of disagreement with his predecessors.

Her argument proceeds in three parts. First, she argues that Aristotle believes that material causes in nature are dependent on formal causes in nature. Although Scharle never specifies this, the dependency relation that she has in mind is presumably an ontological one, meaning that, at least in natural substances, matter cannot exist without form, and *vice versa*. Aristotle's critique of his predecessors then pertains to their failure to realize that even at the elemental level, material natures cannot operate independently of formal causation, and that their concept of material nature itself was, therefore, inherently confused.

Next, Scharle argues that for Aristotle efficient causes always require a formal and final cause, meaning that efficient causes cannot exist—let alone operate—independently of formal and final causes. The reason why Aristotle's predecessors failed to acknowledge this is that they thought that only manifest entities could be efficient causes, whereas Aristotle identifies efficient causes with internal, non-substantial principles. Natural substances, on this account, 'are efficient causes *only* because of the formal principles at work in them' [36]. And these formal principles are—if they are intrinsic efficient causes of their outcomes rather than mere accidental efficient causes—themselves dependent on the end and final cause to which they are directed.

Finally, Scharle argues that for Aristotle only intrinsic efficient causes count as efficient causes in a strict sense, and that accidental efficient causes are always dependent on efficient causation in the

strict sense, which amounts to saying that there is never any efficient causation that is independent of final causation. It is here that the radicalism of Scharle's ontological dependency thesis becomes apparent, and where, for me at least, her argument loses some of its plausibility. Aristotle's natural treatises are full of explanations in terms of non-accidental efficient causes that act independently of final causes. The most famous is perhaps the example of the Moon's moving in between the Sun and the Earth as the efficient cause of an eclipse:[4] the Moon does not interpose itself for the sake of causing an eclipse, but Aristotle nevertheless thinks that this phenomenon can be explained scientifically.

Ultimately, Scharle hopes that her radical interpretation 'shows his [i.e., Aristotle's] views to be more relevant today', as they highlight certain *a priori* issues about the nature of material and efficient causation that 'cannot simply be settled by contemporary scientists' [43]. Although I am not convinced that a pan-glossian portrayal of Aristotle will help to increase contemporary interest in his natural philosophy, Scharle is surely right to stress the importance of studying Aristotle's views on the teleology of the four sublunary elements.

Devin Henry, in the third paper in this volume, presents a rich account of the complex causal relationship between a biological substance's material nature and its formal nature (identified with the living being's soul) in the generation of animals.

Henry starts by demonstrating that Aristotle's appeal to non-intelligent natures as causes of natural development is not, as Galen has argued, vacuous. Henry shows that Aristotle's references to a thing's nature are not explanatorily basic but rather imply more fundamental causal powers or δυνάμεις, because 'organismal natures are themselves a kind of *dunamis*' [50]. This δύνάμις, however, is not some kind of *virtus dormitiva*: Aristotelian δυνάμεις are real causal factors, whose effects can be tested empirically, and which—even from the perspective of modern science that allows capacities to enter into scientific explanations (Henry refers to the work of Nancy Cartwright here)—are potentially explanatory. In explaining the causal role of material natures in animal generation, Henry focuses

[4] See, e.g., *Posterior Analytics* 2.12. Devin Henry discusses some examples from biology [55–59].

on both their negative and positive role. Sometimes, the indeterminacy of matter 'impedes to [*sic*] the teleological efforts of the formal nature in the construction of the embryo' [55], and thereby causes the occurrence of birth defects and monstrosities. For the most part, however, the material and formal natures of the organism interact with each other and produce functional structures. In such cases, the formal natures co-opt the material natures, and material necessity gets subordinated to 'conditional necessity' (i.e., some materials are necessary *given* the development of a particular goal). And finally, there are a few cases where material necessity alone, independently of the teleological actions of the formal nature, produces functional features.

Next, Henry addresses the question whether formal natures are species-specific or individual-specific. Traditionally, scholars have held that the form that is transmitted in sexual reproduction only contains the species-specific features, and that the individual differences among members of the same species are due to material or environmental influences. Henry, on the other hand, defends a rather controversial reading (first proposed in the 1980s by scholars such as Balme and Cooper, but which 'failed to convince the general populace' [60]) that biological forms may include individual features. Henry discusses hitherto unexamined evidence from Aristotle's discussion on inheritance in *Generation of Animals* 4.3, which strongly suggests that individuals have at least some properties that are heritable, because there exist δυνάμεις in the individuals for the formation of just those properties. Since these δυνάμεις are generative capacities of the individual's soul, they must be part of that individual's formal nature, and forms must be individual specific in exactly this sense. Under this interpretation, individual features such as blue eyes and snub noses need not be material accidents; they are rather the outcome of intrinsic efficient causes —even if they do not serve a specific function. Henry concludes by suggesting tentatively, and perhaps even more controversially, that Aristotle might have had a concept of a species nature, which would imply that species are in fact individuals.

Julie Ward, who contributes the fourth paper in this collection, focuses on the question whether Aristotle uses the term 'human' synonymously across various social and political groups or homonymously. Even though, metaphysically speaking, all humans are equal

with regard to their substantiality, Aristotle's remarks in the *Politics* about the restricted rational capacities in women and natural slaves suggest that there are some members of the human species that lack an intrinsic property of being human, namely, the capacity to deliberate. The remarks in the *Politics* also suggest a possible psychological inequality among human beings in so far as they entail (*pace* Aristotle's general account of habituation in the *Nicomachean Ethics*) that there are humans who cannot ever become virtuous through habituation.

Ward tackles this problem by first giving an overview of the various possibilities of homonymous and synonymous predication, while paying special attention to what she calls 'systematic homonymy'. The concept of human resists the usual diagnostic tests for homonymy (as described in *Topics* 1.15), but Ward argues that Aristotle's remark in the *Politics* that not all humans have the deliberative capacity (or at least not have it in the same way) nevertheless suggests that 'human' is to be taken as a homonymous term. In favor of preserving the synonymy of human, Wards develops three different solutions. First, she argues that, if the deliberative capacity belongs to reason, then the absence of deliberation might imply the absence of reason itself, which means that 'human' cannot be considered synonymous for all individual humans. Under this interpretation, 'human' can only apply synonymously to all mature, male, Athenian citizens. Ward calls this the 'restrictive range synonymy'. Second, if deliberation and reason are not co-extensive capacities, then it is possible for some being to have reason but not deliberation and still to be considered human in a synonymous sense. Ward calls this the 'de-linking strategy'. Third, she proposes that we allow for some plasticity in the concept of deliberation: all humans are rational and deliberative, but not to the same degree of completeness. Ward calls this the 'dual deliberation synonymy'. If none of these solutions works, she claims, we ought to conclude that Aristotle's concept of *human* is indeed homonymous.

Ultimately, Ward argues effectively that we should accept a modified version of the 'dual deliberation' view. Assuming that there are different ways in which humans can partake in the same activity, some humans only engage in an everyday type of deliberation, whereas others—the free male citizens of Athens—also engage in the

specialized kind of practical reasoning that is necessary for becoming virtuous. Under this reading, which finds support in Aristotle's discussion of the different levels of potentiality and actuality in *De anima*, Aristotle can consistently hold that human beings are metaphysically equal, while being psychologically different.

In the fifth paper, Errol Katayama argues cogently that not all living beings exhibit the same degree of unity characteristic of substances. A typical organism exhibits both essential unity in number ('numerical substantial unity') which pertains to the unity between its soul and body, and unity in form ('formal substantial unity') which pertains to the unity between its formal, final, and efficient cause; but—so Katayama argues—hybrids and spontaneously generated animals possess neither of these forms of unity. Therefore, these latter kinds of living beings are not substances.

Katayama's argument proceeds by a detailed analysis of the relevant senses of essential unity Aristotle distinguishes in *Meta.* 5.6 and 9.1. In these investigations it is assumed that Aristotle in fact presents a criterion for the identification of substances in the *Metaphysics*, and that 'substance' refers both to composite organism and to the form of this composite. While the criterion of formal substantial unity identifies form as substance, the criterion of numerical substantial unity identifies composite substances; and something is a composite substance only if its form is a form-substance. Second, Katayama assumes that among the four senses of unity (i.e., unity of an organism, its form, its genus, and its λόγος), unity in one sense implies unity in all the other senses. And finally, Katayama identifies reproduction as the key unifying activity of living beings *qua* substance.

Katayama then singles out sterility as an example of a form of 'deformity' in animals that affects the substantiality of the animal as a whole, and traces the source of this deformity back to a defect in the nutritive part of the soul. All hybrids and spontaneously generated organisms suffer from such a defect, and Katayama explains how each of these kinds of animals fails to be a substantial unity in all the possible relevant senses. Based on an analysis of *Generation of Animals* 4.3, Katayama shows that there is a spectrum of deformities, with monstrosities lacking individuality (and, hence, substantiality) on one extreme end of the spectrum and female organisms, which have both individuality and universality (and, hence, substantiality) on

the other end. Hybrids and spontaneously generated animals resemble monstrosities in that they too are not individuals and, therefore, fail to be substances.

Christopher Shields, in the sixth paper of this collection, offers a subtle and intricate defense of W. D. Ross' interpretation of Aristotle as excluding artifacts from attaining the 'dignity of substance'. Aristotle states explicitly that only living beings qualify as substances; but as Shields points out, it is not easy to see why Aristotle thinks that this is the case, especially because Aristotle *also* sometimes lists artifacts among examples of substantiality. Some commentators have proposed a 'paradigmatic reading', entailing that while there exist non-living substances such as artifacts, Aristotle considered living beings alone to be paradigmatic substances. Against this interpretation, Shields advances a more radical, exclusivist reading, entailing that—at least on the basis of Aristotle's theory of substance as presented in *Meta.* 7–9—*only* living beings are capable of existing diachronically as separate and determinate entities and, therefore, that only living beings are substances.

Shields' route to the exclusive interpretation is based on Aristotle's argument that only things with natures qualify as substances. All things with natures have an internal principle for motion and rest; but in order to be substantial the natural thing also needs to have the capacity to initiate, stop, and reverse the motion, and also to control the directionality of the motion. Thus, for natural things to count as substances, they have to be sufficiently 'cybernetic', which is 'already close to being living systems' [139]. For living beings, the cause of their systemic directionality is the soul and the soul is a substance. Souls as substances are, so Shields points out, sortally-determinate, that is, they are the cause of different kinds of living beings' being the kind of thing they are. In addition, souls are causes of the existence of living beings as unified beings, that is, souls are the internal organizing principles of the characteristic activities of the living being in question. These activities, in turn, are also unified in that all are for the sake of one single identifiable end. On this account, substances turn out to be 'irreducibly teleological systems with specifiable intrinsic goods' [143], which is co-extensive with being alive. This, then, explains why neither artifacts nor elements can count as substances.

The question then remains to what ontological category artifacts belong if they are not substances (Shields does not return to the question why Aristotle sometimes mentions artifacts as examples of substances). Shields argues that for Aristotle this question is misconceived, since it is based on the false supposition that artifacts are something determinate, whereas they are not. Only things 'which exist determinately require consideration for categorical membership' [144]. The indeterminacy of artifacts becomes clear in Shields' discussion of Aristotle's analysis of the Platonic paradoxes concerning growth. If we are to distinguish which entity is growing and which entity disappears in the process of growth, one of the two needs to be a substance that has non-conventionally specified ends. Since only living beings have non-conventionally specified ends, artifacts are unable of existing diachronically as separate and determinate things; thus, they lack the kind of determinacy and stable identity required for counting as a substance.

John Mouracade contributes the final and perhaps most ambitious paper in the collection. His main purpose is to set up Aristotle's concept of form—which is ultimately to be identified with DNA—as the theoretical link necessary for bridging the gap between biology and metaphysics in contemporary, non-reductive materialist views about personhood.

Mouracade first offers a rather quick overview of non-reductive materialist theories of persons. Grouping supervenience, emergence, and constitution theories together, Mouracade argues that these theories all fail to make clear how the person 'comes to be' from the body. Simply referring to biologists or pointing to the complexity of the body will not suffice to complete these theories. Animalism, on the other hand, entails an immediate connection between biology and metaphysics; but, as Mouracade points out, that does not mean that there is no more work left for the metaphysician: it still remains to determine what it is that makes something an organism. Mouracade then reviews theories of organisms by Eric Olson and Peter van Inwagen, but again concludes that these theories are ultimately defective. In order to complement these theories, he claims, one ought to invoke Aristotle's hylomorphism.

In the next section, Mouracade discusses the basics of Aristotle's hylomorphism and his theory of form. Here the most important point

is that, in the natural treatises, form is ultimately developed as soul, which is the internal cause of unity that structures individuals—and which, according to Mouracade, is exactly the notion that is needed to complete the non-reductionist account. This Aristotelian concept of form is then linked to DNA, by which Mouracade means 'the entire "genetic complex"' [169n46]. DNA is well suited to play the role of formal cause, because, at least so Mouracade argues, it is formal; it is an internal cause of unity, self-regulation, and self-maintenance; and it combines efficient and final causality. It also provides the basis for both diachronic and synchronic identity.

Mouracade ends with a defense of Aristotelian teleology: once distinguished carefully from Platonic or vitalist theories, a naturalistic theory of teleology could be acceptable in biology and 'would allow for the understanding of DNA as a paradigmatic case of Aristotelian form' [175]. It remains to be seen whether biologists will concur with Mouracade's optimism, but the suggestion is an interesting one.

In sum, this collection presents a broad and diverse perspective on Aristotle's (meta-)physics of life, and forms a welcome addition to the growing scholarship on this topic. I recommend it to all those interested in ancient philosophical theories of form, substance, and life, and in its potential intersections with contemporary debates in the life sciences.

BIBLIOGRAPHY

Balme, D. M. 1980. 'Aristotle's Biology was not Essentialist'. *Archiv für Geschichte der Philosophie* 62:1–12. Repr. in Gotthelf and Lennox 1987, 291–312.

Cartwright, N. 1989. *Nature's Capacities and their Measurements*. Oxford.

Cooper, J. M. 1990. 'Metaphysics in Aristotle's Embryology'. Pp. 55–84 in Devereaux and Pellegrin 1990.

Devereux, D. and Pellegrin, P. 1990 edd. *Biologie, logique et métaphysique chez Aristote*. Paris.

Gotthelf, A. and Lennox, J. G. 1987. edd. *Philosophical Issues in Aristotle's Biology*. Cambridge.

Lennox, J. G. 2001a. *Aristotle's Philosophy of Biology: Studies in the Origins of Life Science.* Cambridge.

_____ 2001b. *Aristotle on the Parts of Animals I–IV, Translated with an Introduction and Commentary.* Oxford.