

**Conference on Critical Philosophical Approaches to Aristotle's *Parts of Animals*
University of Cambridge Faculty of Classics (in conjunction with Birkbeck Philosophy)**

Abstracts

Myrto Hatzimichali: Situating the *Parts of Animals*
in the biological corpus

This contribution will inquire into the place of the *Parts of Animals* within Aristotle's biological project. The focus will be primarily on the actual scientific procedures of Books II-IV rather than the self-standing theoretical introduction of book I. Some indications for how his works fit together are offered by Aristotle himself in the programmatic passages from *History of Animals* Book 1. Nevertheless, there are notable differences in tone and overall strategy between *PA* and the other major explanation-focused treatise, the *Generation of Animals* (for instance, the near-absence of argument in *PA* compared with the *aporiai*-raising but also combative *GA*), which merit further investigation. This contribution will also consider the issue of cross-references and/or parallels between *PA* and the other biological works, in the light of the debate over Balme's view that *HA* postdates the other treatises.

Christopher Frey: Analogy and kinds

In the *Parts of Animals*, Aristotle argues that a single investigation can study the parts of organisms that belong to different kinds so long as those parts are analogically united. Aristotle does not provide a detailed account of what commonalities suffice to effect an analogical unity. Instead he offers numerous examples that involve what appear to be different kinds of relation. Hands and claws are analogous because they share a characteristic function, viz. prehension. Pounce, fish-spine, and bone are analogous because of their shared material characteristics. And the octopus' mytilus and the heart are analogous because of their common physiological location. I will investigate these examples and try to show that Aristotle employs a single account of analogy in his biological works. This account centres on Aristotle's claim that analogically common features do not fall along a continuum ordered in terms of more or less. Analogous *relata* are discontinuous in a way that prevents any definition from applying to both. This paper aims not only to clarify Aristotle's use of analogy, but to clarify his understanding of biological kinds as well.

Jessica Gelber: Scientific explanations in the *Parts of Animals*

In his methodological introduction to *Parts of Animals*, Aristotle gives the following advice to the natural scientist who hopes to explain why organisms have the parts and features they do:

Hence it would best to say that, since this is what it is to be a human being, on account of this it has these things; for it cannot be without these parts. If one cannot say this, one should say the next best thing, i.e. either that in general it cannot be otherwise, or that at least it is good thus. And these things follow. And since it is such, its generation necessarily happens in this way and is such as it is. (This is why this part comes to be first, then that one.) And in like manner one should speak in precisely this way about all of the things constituted by nature. (PA I.1, 640a34-b4)

It is unclear, however, what this advice actually is, and there is scholarly disagreement about how to interpret almost every line (divergent interpretations of this passage are found in, e.g., Balme 1972/1992: 87; Code 1997: 139-142; Cooper, 1987: 254-5; Gotthelf 1987 as reprinted in Gotthelf 2012: 175, and Gotthelf 1985 as reprinted in Gotthelf 2012: 219-220; Johnson 2005: 189; Kullman 1974: 37; Lennox 2001a: 134-5). For instance, the short phrase, 'And these things follow' (*tauta d'hepetai*) could

be taken as indicating that things such as generation ('these things', that is, referring to what comes next in the text) are later (they 'follow' in the sense that they should be given after the earlier explanations have been provided). Or it could be referring back, to the previous lines, and making the point (as Balme understood them) that some parts merely 'follow' in the sense that they are a consequence of the presence of other parts. There is also no consensus about how many types of 'necessity' are being spoken of here, or about what they are.

Given that this passage purports to be making recommendations to the students of nature, it is well worth getting clearer about what these recommendations are. In this chapter, the interpretive options will be presented and critically assessed.

Monte Johnson: Exhortation to biological research in *PA* I.5

In the *Parts of Animals* I.5 (644b22-645a36), Aristotle offers a famous exhortation (protreptic) to the study of animals and plants. Commentators have frequently described this text as being stylistically and even syntactically distinct from the rest of the work, and from the rest of the biological works in general. Here we catch a glimpse of that "golden flow" of speech which the ancients attributed to Aristotle on the basis of his popular works, but which is vanishingly rare in the *Corpus Aristotelicum*. A close comparison of the text with the fragments of Aristotle's lost popular work the *Protrepticus* (*Exhortation to Philosophy*) and to parallel protreptic prolegomena in *De anima* I and *Metaphysics* I indicate that the protreptic rhetoric in the *Parts of Animals* I, like that in *De Anima* and *Metaphysics*, originated as an adaptation of certain rhetorical tropes and which had been successfully employed in the *Protrepticus* and that are outlined in detail in the *Rhetoric* I.4-7.

Kosta Gligorijevic: Honour and value: timios and its cognates in Aristotle's zoology

Aristotle's zoological works contain a number of passages in which Aristotle calls animals, their parts, or their kinds timia (honourable, valuable). These claims seem clearly normative, but the precise character of the norms involved is far from obvious. This paper presents an interpretation of these claims, arguing that Aristotle's use of timios and its cognates is motivated by metaphysical considerations concerning the character of first causes (archai). By comparing the usage of timios within the zoology with claims concerning timia elsewhere in the corpus, the paper concludes: (i) that the paradigmatic cases of timia are archai; (ii) that Aristotle expects archai to be characterized by their unity and separation from their effects; (iii) that the archai of animal life are unified and separate to various degrees in the bodies of various animal kinds; (iv) that Aristotle holds animals in which the archai meet this description to be more valuable than those in which they do not. Together, these findings indicate that Aristotle's zoological research in the *Parts of Animals* is informed by his conception of archai, and that his belief in the comparative value of animal kinds may be explained by the comparative degree of unity and separation of their archai.

Mary Louise Gill: *Nous* in the *Parts of Animals*

This chapter addresses the vexed question whether mind is a proper (or even essential topic) for investigation in Aristotle's science of nature. Many scholars think that *Parts of Animals* I.1 denies that intellect is part of nature and provides decisive evidence that he excludes mind as a suitable topic for natural philosophy. In this chapter I shall present the reasons for thinking that mind is an appropriate topic for natural philosophy, and then go through the relevant section of *Parts of Animals* I.1 that suggest to the contrary that mind should not be studied by natural philosophy, but perhaps by some other discipline instead, presumably first philosophy (metaphysics). I shall argue, with detailed attention to *PA* I.1, that Aristotle presents three arguments to exclude mind from nature but all in the

voice of an opponent. Then I shall argue that Aristotle directly responds to the third argument in *PA* I.1, with indirect implications for the first and second as well.

Devin Henry: *Bios*, differentiae and the *Parts of Animals* I

In *History of Animals* I.1 Aristotle identifies four main differentiae (*diaphorai*) by means of which animal kinds are to be distinguished: ways of life (*bioi*); activities (*praxeis*); characters (*êthê*); and parts (*moria*). In this paper I explore the relationship between these four differentiae in *Parts of Animals* ii-iv with special attention to the role played by an animal's *bios*. In a general way Aristotle's concept of a *bios* can be usefully compared to the modern concept of a 'niche' insofar as both describe what we might call an animal's collective ecology (its habitat, how it communicates, its mating habits, ways of feeding, etc.). However, a 'niche' is traditionally understood as a place in ecological space into which species are fitted, which exists independently of the species that occupy it (Pocheville 2014, 547), whereas Aristotle's *bios* refers to an animal's characteristic way of making a living (e.g. lions are live-bearing, carnivorous, land-dwelling animals that live in social groups) and so cannot be conceptualized apart from the animal whose *bios* it is. I shall argue that an animal's way of life is a causally basic feature of its substantial being: it serves as a final cause of certain other features of the kind, while nothing more fundamental is a cause of it. Nevertheless, by introducing an explanatory role for *bios* Aristotle is not attempting to identify that *single* essential feature of a kind that (as others have claimed) satisfies the *Analytics*' concern to identify the source of unity for living things. On my reading, an animal's *bios* is not defined by a single differentia alone; rather, each animal's way of making a living is an irreducibly complex set of differentiae none of which is privileged over the others.

Chiara Blanco: The relation between fertility and body-size in the *PA*

'That part of the blood which ought to go to form semen and seed gets used up in forming lard and suet, which are formed by the concoction of blood. Hence in fat animals there is either no residue at all, or else very little' (*PA* 2.651b14-18).

This paper sets out to provide an interpretation of the passage above, by exploring the relation between fertility and body-size in Aristotle's biological works. In the first part I will investigate how immoderate nourishment can be harmful for the animal. As stated at *PA* 2.651b3-4, an excessive amount of lard and suet can be injurious for the body, and unduly fat animals therefore tend to age too quickly (*PA* 2.651b9-13).

In the second part of my paper, I will investigate how excessive body-size in animals leads to reduced reproductive capacities. I will start by focusing on Aristotle's analysis of the case of mules, where the altered distribution of residue, which is diverted to produce growth, is claimed to be one of the determining factors behind the infertility of the whole $\epsilon\tilde{\iota}\delta\omicron\varsigma$ (*GA* 2.748b20-31). Likewise, at *GA* 2.746b22-30 an excessively nourished body is deemed to cause infertility in both women and men. By reading Aristotle's biological works side by side, this paper aims to explore how the transformation and distribution of blood during the different phases of concoction affects the nutritive and reproductive capacities of the animals.

Stasinios Stavrianeas: The uniform parts

The relation between teleological and mechanical explanation in Aristotle's physics has received detailed attention in Aristotelian scholarship. Such discussions aim, on the one hand, to examine how inanimate, lower-level natural bodies that are themselves governed by mechanical necessity can come to serve final causes by being subject to hypothetical necessity. On the other hand, they aim to study the way in which phenomena governed by final causes such as the generation, development and functioning of animate bodies are determined, restricted or compromised by the dispositions of lower level material bodies whose behaviour, at least when outside the context of animate bodies, is

controlled by mechanical laws. The discussion of uniform parts in *PA* II offers us valuable material in order to clarify such questions. Uniform bodies represent a middle level between inanimate bodies (elements or the powers) and non-uniform parts (the functional organs of organisms). Their level, then, links the natural inanimate bodies (supposedly) governed by mechanical necessity to the animate teleologically governed organisms. Furthermore, Aristotle develops two concepts of chemical processes in explaining how the rich variety of uniform compounds in nature is formed, namely *mixis* and *pepsis*. The first seems to be a mechanical process characteristic in the constitution of inorganic material, which is teleologically neutral, merely ‘muting’ the nature of its ingredients, while *pepsis*, by contrast, is a teleologically directed process that transforms or perfects the nature of its ingredients for some end, explaining thus how organic matter gets formed out of inorganic material constituents. By examining the *PA* discussion of uniform parts (considering also relevant passages from the *GC* and *Metereologica* IV) I wish to throw light into two basic areas:

- (1) what is the role of *mixis* and *pepsis* in the formation of uniform parts, and in particular is the process of *mixis* preparing elemental matter so that uniform animal parts can be formed?, and
- (2) Test the validity of the divide between elemental matter supposedly governed by mechanical necessity and organic matter governed by teleological necessity a valid one. For on the one hand we have evidence (from both *PA* II.1 and *Meteorology* IV.12) the final causation influences the level of elementary matter, while on the other it is not at all clear how such determinations are supposed to work.

While considering these questions I am going to discuss the explanatory work that the different levels of material composition are supposed to carry out within the framework of the *PA*.

Sophia Connell: Blood, intelligence and character

Of all the bodily parts, blood (or its analogue) is one of the most fascinating and complex in Aristotle’s biological ontology. Blood exists from the time an animal begins its life (*HA* 521a6-9) and is the matter for all the other parts of the body (*GA* 751b2, *Juv.* 469a1). Within the blood we find potentials and powers which determine an animal’s emotional responses, character and capacity for intelligence. It can also carry the capacity to generate another living being, similar in particular ways to parents and ancestors (*GA* 725a11, *GA* IV.3). And finally, it is crucial for conveying sensory information from the sense organs to the central sensorium, the heart (*Somn., Insomn*). This chapter will concentrate on what *Parts of Animals* II.2 can tell us about character and intelligence of different animals due to the consistency and temperature of their blood. Blood consistency is a useful tool at various levels of explanation for Aristotle in his biology and zoology. This is why, even though, strictly speaking, it is not a part of the body, he must include a detailed discussion of the blood in his work on animal parts. Although it may seem that the nature of blood is accidental (Leunissen 2017, ch.1), I will argue that character (*ethos*) and the propensity to discern sensory differences which allow for intelligence are crucial parts of an animal’s essence and so cannot be left to chance (see also Gelber 2015, Frey 2015, Deslauriers 2009). Thus, the nutritive soul must ensure that a certain type of blood facilitates these functions. There is, however, room for diet and environment to affect the animals’ blood, which allows Aristotle to explain sub-species differences in character, such as that between males and females and those who live in colder or hotter climates.

Giouli Korobili: PA II.10: The Ritual of Genesis: Blood, Semen and Nature as the first ‘Choephoros’

In a well-known passage from the *PA* (II.10), Aristotle refers to man as that living thing which partakes, either alone or more than all the rest, of the divine. Apart from the capacity for perception, man has also far greater structural diversity, which means that he is naturally endowed with the ability to participate in living well (εὖ ζῆν). Nevertheless, as James Lennox observes, “[Aristotle] does not explain

how such a life is connected to greater organic diversity” (Lennox 2001: 222). This creates an obscurity which I will attempt to resolve by focusing on Aristotle’s, as yet unexplored, reference to animals’ form (ἰδέα) as πολυχουστέραν, literally translated as ‘that which pours forth much more’. At first glance, it is not at all clear what this claim amounts to. Most scholars take πολύχους to be practically interchangeable with πολυειδής or πολύμορφος, but the use of all three of them in the same context suggests that there must be at least a slight difference between them, otherwise some should be considered pleonastic. A quick search of the TLG shows that the word and its cognates are attested only once or twice in pre-Aristotelian authors, while after Aristotle they appear to come into widespread use. There arises therefore a need to concentrate on πολύχους and study its other occurrences in Aristotle, if we are to clarify the meaning of πολυχουστέραν in our passage on much safer grounds, and identify, by extension, what sparked its widespread use in later times. In this talk I will address this need by scrutinising the possibility that such occurrences are intended to indicate ritual acts, transferring, in this way, the whole discussion to the domain of ritual. The ritual of *choai* (libation) appears to have been common among the ancient Greeks and consists in the intentional pouring of some liquid on the ground or on any body of water, even on an altar or a tomb. It is probably understood as a sacrificial act involving the spending of an important substance. If this possibility proves out, a number of fundamental questions relating to the conditions of the ritual act, such as ‘who the requester is’ and ‘what she requests’, ‘what the libation consists in’ and ‘what kind of gift-in-return is received and by whom it is offered’, will be investigated.

Klaus Corcilus: Aristotle on the heart

In *PA* II.1 the heart is said to be the locus of nutritive, sentient and motive soul capacities. The heart also cuts across a fundamental distinction in Aristotle’s classification of animal parts, namely uniform and non-uniform parts, for the heart is both: a uniform part by virtue of receiving all sense perceptions and a non-uniform part because it is involved in motion and action (*PA* II.1, 647a25-30). As in the *Parva Naturalia*, the heart in the *PA* is strongly associated with the soul and is said to be ‘the principle of life’ (III.3, 665a12; IV.5, 678b3); furthermore, the very location of the heart marks its role in governing (*archikên*) (III.4, 665b18) and lends dignity by determining bodily orientation. It is also said to be the controlling part (*kuria*) and thus in need of special protection from sinews (III.3, 673b12). These extraordinary statements about the heart in the *PA* invite fresh analysis, particularly in light of other detailed discussions of its sensory and motor functions in related works (e.g. *de Anima* and *de Motu Animalium*). This chapter will discuss two closely related topics: (i) the privileged role the heart plays in Aristotle’s theory of animal parts, i.e. what he thinks its job is and how he wishes to demonstrate its necessity (e.g. at *PA* III.7, 70a20f.), and (ii) his cardio-centrism, i.e. his doctrine according to which the heart or its analogue in bloodless animals is the seat of the vital functions. It will end with a discussion of the relation of the heart to the animal’s vital perceptual and motor functions.

Michael Peramatzis: Matter and form in the *Parts of Animals*

I shall discuss some central passages taken mainly from the *Parts of Animals* Book I (but also other books of this work) to examine how Aristotle applies his distinction between form, matter, and compound to his inquiries into living beings. The basic question I shall address is what the *Parts of Animals* I reveals about his view of the nature of form and its relation to the matter and the compound. More specifically:

- (1) Is the form of living compounds ‘pure’ or ‘true-gritty’? That is, is it essentially matter-free and definable independently of matter, or is it essentially matter-involving and must its definition mention certain types of matter?

- (2) Assuming that Aristotle subscribes to his standard view of form as ontologically ('in being'), causally-explanatorily, and definitionally prior to the matter and the compound, how can the form of living compounds satisfy this priority requirement if it is 'true-gritty'?
- (3) If, by contrast, the form of living compounds is 'pure', how can it be the ontological, causal-explanatory, and definitional principle of *material* and *changeable* living compounds? How can it be their efficient cause in the ways in which Aristotle argues that the form is an efficient cause of living beings?

I shall argue that in the *Parts of Animals*, too, Aristotle seems to think that the form of living compounds is 'true-gritty' in that it is essentially matter-involving. At the same time, though, this sort of form is prior in all important ways to living compounds and their matter. Simply put, the matter that is essential to form is of a different ontological order if compared with the matter of living compounds. If so, an essentially matter-involving form can fulfil the priority requirement. I shall undergird this claim by examining whether and how the *Parts of Animals* can shed light on the difference between the type of matter that is essential to form and the matter that is involved in living compounds.

Emily Kress: Human parts and bird parts

In his transition to the non-uniform parts of blooded animals in *PA* II.10, Aristotle makes the claim that the human kind is among those that are "more polymorphic in visible character" and "those whose nature partakes not only of living but, in addition, of living well", since "of the animals known to us either mankind alone, or mankind most of all, partakes of the divine" (656a4-8). For this reason, "both because of this and because the shape of the external parts of mankind is most familiar, one ought to speak about mankind first" (656a9-10). My focus is how this strategy of beginning with the human kind structures the explanations of the parts of the *other* animals. I argue that it both creates new puzzles that need to be solved by the natural scientist and also offers new solutions to other puzzles that arise from Aristotle's commitments. One category of new puzzle is the surprising "absence" of a part—which is only made salient by reference to the human case. One category of new solution is to the puzzle of how to identify the basic function or capacity of a part that seems to be used for multiple actions. I argue that one of Aristotle's strategies for resolving this sort of puzzle is to use the *human kind* to identify a basic function of the part.

Biographical Information about speakers:

Chiara Blanco completed her PhD in the Faculty of Classics, University of Cambridge in 2018. She has held teaching positions as language tutor at Cambridge in Classics tutor in Oxford. Her thesis was an interdisciplinary study of the soul and its representations in literature, art, archaeology and philosophy. She is currently beginning a research project on skin and the senses in Antiquity.

Sophia Connell is lecturer in ancient philosophy at Birkbeck College, University of London. She is a former Fellow of Selwyn College, Cambridge. Her main research interests are ancient Greek philosophy and the history of analytic philosophy. She has published *Aristotle on Female Animals* (Cambridge, 2016) and is the editor of *The Cambridge Companion to Aristotle's Biology* (forthcoming). She has published articles on Aristotle, Galen and Plato. Her current research in ancient philosophy focuses on the relationship between Aristotle's natural and political sciences.

Klaus Corcilius is Professor of Ancient Philosophy at the University of Tübingen. He has taught at the University of Hamburg and the University of California, Berkeley. He is author of a book and several articles on Aristotle's theory of desire, animal motion, and human action. Currently, he works on a commentary and translation of Aristotle's *De Motu Animalium*. Recent publications include a volume co-edited with Dominik Perler *Partitioning of the Soul in Ancient, Medieval and Early Modern Philosophy* (De Gruyter, 2014).

Christopher Frey is Associate Professor of Philosophy at the University of South Carolina. He earned his Ph.D. from the University of Pittsburgh. He works primarily on Aristotle's natural philosophy and metaphysics and is currently writing a book entitled *The Principle of Life: Aristotelian Souls in an Inanimate World*. He also works in contemporary philosophy of perception and mind and have written extensively on the relationship between the intentionality and phenomenality of perceptual experience.

Mary-Louise Gill is the David Benedict Professor of Classics and Philosophy at Brown University. Her work primarily focuses on Plato, Aristotle, and other (primarily Greek) ancient philosophers. She is the author of three books: *Aristotle on Substance: The Paradox of Unity* (Princeton, 1991) *Plato: Parmenides* (Hackett, 1994) and *Philosophos: Plato's Missing Dialogue* (Oxford, 2012) and has previously served as the Chair of the Faculty of Brown University, the Chair of Classics at the University of Pittsburgh, and on the editorial boards of numerous journals and books

Jessica Gelber is Assistant Professor in the Philosophy Department at the University of Toronto. She has also taught at the University of Pittsburgh, Syracuse University and the University of California, Berkeley. Her current projects focus on the relation between Aristotle's conception of science and his metaphysics, and on questions about the nature of causation and explanation. She has written articles on Aristotle's natural history, teleology, metaphysics and embryology.

Kosta Gligorijevic is a Ph.D. candidate in philosophy at McGill University, Montreal. His research concerns ancient metaphysics and philosophy of nature, with a special emphasis on Aristotle's biology.

Myrto Hatzimichali is University Lecturer in Classics at the University of Cambridge, and Fellow of Homerton College. Her research interests centre on intellectual and cultural history, especially on the ways in which literary and philosophical texts were transmitted, received and professionally studied in the Hellenistic and Early Imperial periods. She is the author of *Potamo of Alexandria and the Emergence of Eclecticism in Late Hellenistic Philosophy* (Cambridge, 2011), and has contributed

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Devin Henry is Associate Professor at the University of Western Ontario. He is the author of numerous articles on Aristotle's philosophy of science (including classification, teleology, heredity, and sexism) as well as Plato's late epistemology. He is also the co-editor of *Bridging the Gap Between Aristotle's Science and Ethics* (Cambridge, 2015). His forthcoming book is entitled *Aristotle on Substantial Generation: Matter, Form and Moving Causes* (Cambridge, 2019).

Monte Ransome Johnson is Associate Professor of Philosophy at the University of California, San Diego. He is the author of *Aristotle on Teleology* (Oxford, 2005) and of numerous essays on ancient philosophy and science, including contributions to *The Cambridge Companion to Lucretius* (Cambridge, 2007) and the *The Cambridge Companion to Aristotle's Nicomachean Ethics* (Cambridge, 2014). He is currently working on a reconstruction of Aristotle's lost work the *Protrepticus*.

Giouli Korobili completed her PhD entitled "Centering on Life. Aristotle's *On Youth and Old Age, on Life and Death, on Respiration*, chapters 1-6. Translation, commentary and interpretative essays" at Humboldt-Universität zu Berlin. She worked as a Topoi Research Fellow (Area D2 – Mapping Body and Soul) on the project "Mapping the Vegetative Soul. Nutrition and Nutritive Soul in Aristotle and Aristotelianism". She is currently a Research Fellow at Humboldt-Universität zu Berlin, working among others on the project "Biology meets Philosophy in Byzantium: Michael of Ephesus on Aristotle's views of Life and Death".

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