Philosophical Reflections on Aristotle's *Historia Animalium*: Mapping the complexity of life

Paper abstracts

Day One:

'What is a *Historia*? Reflections on the *Analytics* and *History of Animal*s'
David Bronstein

In this paper I compare Aristotle's account of *historia* in two well-known passages: *Prior Analytics* 1.30, 46a17–27 and *History of Animals* 1.6, 491a7–14. In both passages Aristotle characterizes a *historia* as a collection of facts on the basis of which explanatory facts are distinguished from explained facts. I first argue for an interpretation of the *Prior Analytics* passage that builds on recent work by Marko Malink. Malink has argued (successfully in my view) that Aristotle's conception of *historia* in *Prior Analytics* 1.30 presupposes the conception of 'natural predication' developed in *Posterior Analytics* 1.19–22. I go further than Malink in arguing that Aristotle's conception of natural predication presupposes the distinction between essential and accidental predication. It follows that within an *Analytics*-style *historia*, the essential facts are distinguished from the accidental facts. This raises an important question for the *History of Animals*: does the text similarly distinguish between essential and accidental facts? In general, how similar is Aristotle's conception of *historia* in the two texts? What do the similarities and differences reveal about the relationship between the *Analytics* and biological works?

'The Epistemologies of the *Historia animalium* , or: What is a fact in the *Historia animalium*?'
Katharina Epstein

Only two steps of biological inquiry are recognized expressly by Aristotle and only two corresponding sets of biological writings have survived, a record of facts on the one hand and several records of explanations on the other. The 'facts' recorded in the *HA* are classified by Aristotle himself as the ὅτι or as τὰ φαινόμενα, two terms best understood through the tension in which they stand towards their correlates, the διότι or αἱ αἰτίαι. In theory, *HA* facts belong to a step of scientific inquiry which is prior to all other steps of this inquiry: they propose to record what is accessible κατ΄ αἴσθησιν and thus seem entitled to a substantial claim to immediacy and objectivity. What the *HA* records is not digested by causal thinking; it is, it appears, less affected by the shaping and potentially distorting powers of doctrine or dogma. Accordingly, the *HA's* project has been termed „descriptive".

In older scholarship, just one aspect of this apparent epistemic immediacy was emphasised, for the *HA* was taken to present a rather random cluster of information lacking internal organization. This defectiveness was then taken as a basis to deny Aristotelian authorship of substantial parts of the *HA*. In the past decades, however, stimulated by the discussion about Aristotle's classification of animals, the organizational scheme of the *HA* has begun to be appreciated in its own right.

Nonetheless, both the old and the more recent view of the *HA*, I would like to argue, leave noteworthy facets of the *HA's* variety of facts unconsidered. In accordance with this variety of facts, several epistemologies can be said to underlie the *HA*, thereby endowing the project of expounding the 'ὅτι' with a certain degree of epistemic autonomy.

Accordingly, it is possible to typologize the variety of "*HA*-facts", for example:

- encyclopaedism, lists, (open and closed bodies of knowledge),
- rudiments of quantification such as "sometimes, usually, rarely, many, a few etc." in *HA* VII (IX) 6.585 b 28ff. (possible tokens of proto-probabilistics?) ,
- indication of sources and lack thereof (λέγουσι, φασι, δοκεῖ)
- geographical/biogeographical information (the import of the Greek tradition of ἱστορία and logographoi)
- traces of folklore, bias, ideology, as in views about the female (Epstein 2018 and colleagues' contributions) (doctrinal thinking)
- statements with phrasing like σημεῖον δέ, ἤδη δέ, γάρ... (traces of causal linking)

This epistemic autonomy, I would like to argue, is an apt basis to ponder the notion of 'pure science' or 'pure doctrine' which is defended by some scholars of Aristotle.

'"For a more precise account go study the *Historiai*." Towards the establishment of the *Historia animalium* as a biological work of reference'

Giouli Korobili

Akribeia, perhaps best translated "precision" or "exactness", is one of the major concerns Aristotle is sensitive to, especially because it has to do with methodological appropriateness. Throughout his biological works, Aristotle is frequently content to provide an account in outline form, while at the same time promising that he will set it forth afresh in the *Historia animalium* with more precision. In such contexts, he often invites his addressees to make use of *anatomai* ("dissections"), a term sometimes referring to his lost, homonymous work, which contained anatomical illustrations, and at other times referring to the actual practice of dissections. Yet, Aristotle never gives us even a slight indication as to the respect in which the account offered in the *HA* differs, thus leaving open the question 'What are the features of that account that renders it more *akribēs*?' Given that the notion of *akribeia* in ancient Greek literature is complex, the answer to this question cannot relate solely to the account's length and/or exhaustive treatment of a topic. Some of the connotations carried by *akribeia* include but are not limited to: the precision of the fit among different components, the showing of a high degree of detail, a faithful reproduction, the strictness of an account or the exactness of a measurement attained through the use of precision instruments. This paper aims to identify those distinctive characteristics of certain *HA* accounts that qualify them as *akribē* by following two main steps: first, by discussing those self-referential passages found in *De partibus animalium*, *De generatione animaliu*m and *De respiratione* in which Aristotle

explicitly refers to his *HA* accounts; second, by comparing the corresponding accounts with each other and highlighting the distinctiveness of the *HA* accounts.

"*Historia animalium* 8(9).5-6, De mirabilibus auscultationibus 5 & 75, and two of Theophrastus' lost works on animals"
Robert Mayhew

Allan Gotthelf described Aristotelian biological inquiry as consisting in three stages: the collection of data ("the notebook stage"), the organization of data (e.g. *HA*), and the explanation of data (e.g. *PA* and *GA*). He points out that there is no surviving treatise at the collection of data stage, and adds that David Balme once expressed wonder as to whether the *De mirabilibus auscultationibus* (*On Marvelous Things Heard*, hereafter *Mir*.) attributed to Aristotle "might well be authentic, or derive from a notebook that was authentic." There is no question of the extant Mir. being an authentic work of Aristotle. But I thought it would be worth considering whether some part of that work might "derive from a notebook that was authentic"—by which I mean compiled by Aristotle or under his direction. So the aim of my paper is, in effect, to test the (for lack of a better name) Balme-Gotthelf hypothesis.

Thirteen of the opening fifteen chapters of *Mir*. have an obvious connection to passages in *HA* 8(9), and there are an additional seven sets of parallel passages between the two works, all but one involving *HA* 8(9). Further, there is a high concentration of Mir.-passages (eight: *Mir*. 4-8, 11-12 & 75) related to *HA* 8(9).5-6 (on animal intelligence). In this paper I limit my investigation to the relationship between HA 8(9).5 (on cervine intelligence) and the two relevant entries in Mir. (5 & 75), which also (arguably) have some relationship to two lost works of Theophrastus: *On Animals Said to be Grudging and On the Intelligence and Habits of Animals*. Aside from assessing the Balme-Gotthelf hypothesis, I also try to reach some preliminary conclusions about the role of θαυμάσια ἀκούσματα in Aristotle's biological inquiry, while also shedding some light on the possible contribution Theophrastus made to Aristotle's *HA* 8(9).

'"Miscellaneous" activities in *Historia animalium* Book IV'
Myrto Hatzimichali

This paper will focus on Book IV of the *Historia animalium*, a book that has thus far attracted insufficient scholarly attention, especially in comparison to other sections of the work. The second part of Book IV discusses 'miscellaneous' differentiae (perception, voice, sleep and sex differences) in a manner that does not make immediately clear where they fit in the organisation and structure of *HA*. A good case can be made that perception, sleep and voice are activities (perception and sleep are among the *praxeis* investigated in the *Parva naturalia*, while voice is listed under 'lives and activities' in *HA* I.1); the discussion of sex-differentiation and secondary sexual characteristics in chapter IV.11 does not conform with this pattern, but could perhaps be thought to be preparatory for the discussion of reproduction that begins in Book V. This paper will trace the role of these differentiae within Aristotle's broader explanatory project on the causes of living beings: the groundwork done in *HA* IV

informs discussions in the other zoological treatises; but also, very interestingly, in some cases the explanatory work is carried out in the *Parva naturalia*, where e.g. the observations carefully gathered from fishermen's reports are used to back up claims about the medium of smell. By tracing such connections this paper will throw some more light on the overall purpose of the *Historia animalium*.

'Matter and signification: Aristotle on the differences between animals' vocal communication systems'
Diana Quarantotto

In the *Historia animalium* Aristotle includes animals' vocal expression and communication among their *praxeis*. References to this *praxis* are scattered throughout the treatise and concern its various roles in animals' lives and its two main kinds: voice (*phone*) and articulated voice (*dialektos*). The distinction between voice and articulated voice – drawn in *HA* IV 9 – is at the core of Aristotle's inquiry into this issue. The paper focuses on this distinction and aims first of all at understanding why Aristotle considers vocal communication systems alone. Further, it aims at clarifying the difference between the quasi articulated voice of birds and the true articulated voice of human beings. Lastly, given that only humans are capable of *logos* and that humans' *logos* is the only true articulated voice, the paper explores the relation between the specific kind of signification of *logos* and its material substrate and organization.

Day Two:

'Aristotle on female emotions'
Sophia M. Connell

The ninth book of the *Historia Animalium* (Book VIII in Balme's edition) is the only evidence that Aristotle thought women's character to be connected to their biological make up. This paper will explore what exactly Aristotle claims about the affective capacities of female as opposed to male animals and particularly human females, women. While females within a kind are noted to be milder tempered and more thoughtful or intelligent, males tend to spiritedness, aggression and simple-mindedness (*HA* IX.1, 608a22-608b4). When it comes to women, they are 'more prone to tears' and also 'more apt to scold and fight', and 'more shameless and lying' (608b5-11). The pejoratives come thick and fast. However, while these observations might be important from a scientific point of view, they need not be an assessment of the inevitability of women's behaviour. Aristotle insists on ensuring the most virtuous and happiest lives for all people in the community, including the female half the population (*Pol*. I.13, 1260b19-20; *Rh*. I.5, 1361a11-12). Because of this, the evidence from the *HA* IX must be broadened and more deeply analysed.

The differences in character propensities come in degrees and range over animals in general as well as individuals within a kind (*HA* I.1, VIII.1). When these are not pathological, the differences within any given kind will be slight. And since the human-kind is in general

spirited and intelligent, its female specimens will be this too, even if slightly more thoughtful and less spirited than male specimens. Women, and other female animals, are less prone to anger and aggression, tamer and more gentle. These 'character' tendencies have a physiological basis in a body that is slightly cooler and less tightly constructed and blood that is thinner and more watery. The descriptions of the bad behaviour of female humans must also be considered more carefully in the context of descriptive research, where conditions are not ideal for flourishing in the Aristotelian sense. How such tendencies could lead to a women being more shameless and lying must be explained with reference to the unique human way of life in the *polis*, where the control of more 'spirited' men can result in problematic behaviour patterns in response to a mismanagement of gender hierarchies. In these instances, when women's abilities and desires have been undermined and thwarted (for example, if they are treated like slaves, which Aristotle objected to [*Pol*. I.1, 1252b1, I.12, 1259a37f.]) then their reactions will be negative, as here described (Connell 2021). In examining this, the fact that women can and do feel anger and aggressive emotions is brought to light, undermining a widespread view that Aristotle is unable to accommodate such emotions in women (e.g. Harris 2001, ch. 5). Thus, the *Historia animalium* can be found to provide a broader and richer view of emotional responses in female animals, and certain resources toward explaining the 'gender wars' in human societies.

'Sexual Differences and Natural Character: the Reception of the *Historia animalium* in 16th C. Italy"

Marguerite Deslauriers

This paper considers the reception in the sixteenth century of Aristotle's *Historia animalium*, and in particular the passage at IX (VIII in Balme's edition) 608a22-b18 in which Aristotle describes certain differences in the natural characters of male and female animals. Aristotle introduces these as differences more generally among animal species, and categorizes them as *dunameis* with respect to "practical intelligence and simple-mindedness, courage and cowardice, …gentleness and ferocity," as well as other dispositions (608a14-17). Although some of the characteristics he attributes to females are positive, he describes them as softer (μαλακώτερα), less spirited (ἀθυμότερα), and more shameless (ἀναιδέστερον) and lying (ψευδέστερον) than males.

These are the characteristics around which the debate about the worth of women in the sixteenth century often turns. Italian misogynistic literature of the sixteenth and seventeenth century, while it draws on many sources, ancient, medieval and contemporary – Bocaccio's *Corbaccio* in particular – is often described as 'Aristotelian' (e.g. in Virginia Cox, Women's Writing in Italy, 1400-1650, (Baltimore: The Johns Hopkins University Press, 2008), 169-71)). Gaza's Latin translation of the *Historia animalium* was first printed in 1476, and both widely available and influential after that. I will focus on two negative character traits named in the *Historia animalium* and invoked later to reproach women, and the pro-feminist responses to them: 'softness,' or the incapacity to resist pain, and 'shamelessness,' both of which can be traced to features of female physiology on Aristotle's

account. Italian authors to be discussed include Bartolomeo Goggio, *Delle lodi delle donne* (Ferrara, 1487), Agostino Strozzi, *Defensio mulierum* (Florence, 1501), Mario Equicola, *De mulieribus* (Venice, 1501), Lodovico Domenichi, *La nobiltà delle donne* (Venice, 1549), Torquato Tasso, *Discorso della virtù feminile e donnesca* (Venice, 1582), Lucrezia Marinella, *La nobiltà et l'eccellenza delle donne co'diffetti et mancamenti de gli uomini* (Venice, 1601).

The aim of this contribution is twofold: first, to show that both misogynist and pro-feminist writers drew on Aristotle's account of the natural moral characters of the sexes in arguing for and against the worth of women, often linking the moral character to the physiology of the sexes, drawing on Aristotle's biological works for claims about physical as well as moral differences; second, to consider the ways in which what Aristotle intended by such terms as 'soft' or 'spirited' were adapted to the context of the sixteenth century, and how those adaptations have indirectly affected later interpretations of Aristotle's conception of differences in the natural character of the sexes.

'Aristotle on the detection and termination of human pregnancy: *HA* VII.3 and *Pol*. VII.16'
Mor Segev and Anna Schriefl

In *HA* VII.3, 583a34-b28, Aristotle makes a series of observations concerning the detection, progression, and termination of pregnancy in humans, noting, for example, the "perception" felt by the pregnant woman upon conception, a "movement" occurring around the fortieth day following conception, and the different times at which male and female embryos are separated and differentiated (at around the fortieth day and the fourth month mark, respectively). These observations are often taken to provide us with details concerning the specific times at which the embryo either acquires the various parts of the human soul or begins to perform their respective activities. Scholars also often appeal to this text alongside *Politics* VII.16, 1335b19-26, which discusses the time at which abortions are and are not legitimate under ideal political circumstances, in attributing to Aristotle the view that abortion is permissible only before the embryo acquires life and perception, namely, earlier than forty days following conception, based on the account allegedly given in *HA* VII.3. We argue, against this line of interpretation, that the context in which the observations of *HA* 583a34-b28 are made is a treatment of the detection, inducement, prevention, and failure of pregnancy, rather than the ensoulment or the first occurrence of life functions in embryos. Indeed, the discussion in the chapter is compatible with viewing early embryos as ensouled. Moreover, we argue that the remarks on abortion in *Pol*. VII.16, which also occur in the context of discussing the application of practical procedures rather than theoretical psychology or embryology, are also silent on embryonic souls and soul capacities, focusing rather on the experiences of pregnant women (plausibly, the same ones discussed in *HA* VII.3) in determining the criteria for legitimate abortions. Reading *HA* VII.3 alongside *Pol*. VII.16 in this way has significant implications for our understanding of Aristotle's applied ethics. Since Aristotle turns out not to base his criteria for legitimate abortions in the *Politics* on the time at which embryos acquire perception, he may well be altogether unconcerned with the moral status of embryos in devising those criteria. Instead,

we suggest, his reasons most probably have to do with considerations pertaining to women's health. Finally, we trace the debate on Aristotle's views on abortion to ancient and medieval Jewish and Christian thinkers whose views differ in large part due to their different interpretations of Aristotle's corpus.

'Aristotle on menstruation, pregnancy, and delivery'
Myrna Gabbe

How are we to understand Aristotle's depictions of the female in the *Generation of Animals* as a mutilation (ἀναπηρία, 775a15), a monstrosity (τέρας, 767b13), a sterile (ἄγονον, 728a18) and disabled male (πεπηρωμένον, 737a28)? Generally speaking, the dispute among specialists turns on whether Aristotle has a narrow or broad view of female deficiency. According to the narrow reading, Aristotle takes females to be deficient only insofar as they lack the ability to concoct semen fully. According to the broad reading, he takes females to be generative failures and their bodies to be consistently inferior when measured against their male counterparts. The former interpretation minimizes the sex-bias in Aristotle's biology, despite the inflammatory language he uses to describe the female. But the latter reading is charged with running afoul of his assertion that males and females are the same in species and having little textual support. This paper seeks to defend a version of the broad reading of Aristotle's assessment of female bodies. Through an exploration of the causes he assigns to menstruation and conception as well as the descriptions he offers of menstruation, pregnancy, and labor, I argue that Aristotle views female animals, and women in particular, as disabled when measured against their male counterparts because of their inability to perform their particular reproductive functions well. I show, furthermore, that his assessment of the female is founded upon his view that males and females share the same form.

The point of departure for this analysis is Book VII of the *Historia animalium*: a text that has so far received little attention. This book is devoted to the development of men and women, and offers colorful descriptions of menstruation, pregnancy, miscarriage, labor, and lactation. Aristotle's account of these conditions indicates that he takes all stages of women's reproductive lives to be marked by pain and believes their central reproductive functions leave them vulnerable to disease and early death. But, I argue, the account we get in this book of women's burdens do not tell the full story of why Aristotle takes them to be biologically inferior to men. For that, the account Aristotle gives in this book needs to be paired with an exploration of the foundational axiom of his reproductive science: that males and females are the same in species. I argue that Aristotle takes this notion to entail that males and females have the same reproductive function: to produce another like itself, generally through the concoction and emission of reproductive material. I contend that Aristotle uncharitably uses this characterization of the reproductive function to assimilate and compare the concoction and emission of semen to the concoction and emission of both menses *and the offspring*. I show that Aristotle determines females to be defective by measuring the pleasures of semen concoction and discharge against the burdens, dangers, and harms of menstruation, pregnancy, and labor. I conclude that Aristotle views females as disabled men (i.e., unnatural

monstrosities) because, under his reproductive science, they are not fully subject to the benevolent principles of nature.

‘The construction of the female animal in Aristotle’s *Historia animalium’*
Mariska Leunissen

This paper analyzes Aristotle’s depictions of the female animal – her body, character, and behaviors – included as putative facts about animals across his *History of Animals.* In particular, I will focus on the following four striking features of Aristotle’s multi-faceted approach to female animals in this treatise: (1) his – overwhelmingly negative – treatment of the female animal as a deviation from the male norm, most notably concerning the parts of her body (see e.g. I 14, I 17and IV 11) and her character traits (see e.g. VI and IX 1); (2) his ‘practical’ suggestions for reading the female body for signs of fertility and pregnancy (in V 21, VI 18, and VII 1-3); (3) his account of – often violent – breeding practices to which some female animals are subjected (see e.g. VI 22-23, VI 29, VIII 28, IX 1 and 47); and (4) his sensitivity to and knowledge of pain associated with pregnancy, childbirth, and motherhood (across species but especially in human females; see e.g. VII 9, IX 3, XI 29). I will explain how, while some of these selections of putative facts are informed by Aristotle’s own observations and/or philosophical thoughts about the status of female animals, others rather reveal evidence of contemporary prejudice and misogyny that – at least in the context of the *Historia animalium* – remain unchecked.

Day Three:

“Animal intelligence and animal character within the project of *Historia animalium* VIII-IX”
Christof Rapp

In the *Historia animalium* VIII-IX Aristotle undertakes to inquire into what he calls animal’s ‘activities’ and ‘life-forms’. They differ, he says, in accordance with their nutrition and character. In the course of this project he correlates activities (such as mating, migration, strategies for self-defence, hibernation/aestivation) and life-forms (e.g. sessile/wandering, social/solitary, terrestrial/aquatic, living in different kinds of habitat) with different kinds of food or food intake and with different characters, such as fearsome and aggressive. It seems that these correlations provide the basis for explaining why different species of animals differ significantly in their typical behaviour. In the course of this research program Aristotle also acknowledges that non-human animals possess ‘traces of the characteristics to do with the soul’, through which they resemble human beings. It turns out that in saying this Aristotle thinks indeed of something like character traits, certain emotions and emotional dispositions and various forms of intelligence. The paper will examine various examples of animal character and animal intelligence that are mentioned in the course of HA VIII-IX and will use these examples for assessing Aristotle’s ‘official’ theory of the relation between human and non-human animals that he states in *HA* VIII.1 and that notoriously oscillates between gradualism and analogy (Keil and Kreft 2019).

‘Intelligence and Animal Sociality’
Sara Brill

This chapter aims to clarify the role that intelligence plays in supporting animal sociality by contrasting Aristotle’s account of the phronimos behavior of political animals in *Historia animalium* 8 with that of more solitary creatures. While both crane and eagle, for example, accomplish their living intelligently, the crane’s political nature requires that it be capable of communicating a view of the whole to others of its kind for the sake of assuring the shared task of migration. Bees, similarly, exhibit intelligence by the orderly group behaviour necessary for hive construction and maintenance: a distribution of labour and a collection of signs. No such need arises on the part of the eagle, whose *katholon* perception supports its own predatory interests and whose solitary existence extends even to the relations between parents and their young.

The model of animal interaction that arises from this discussion indicates that intelligence supports sociality by providing specific conditions for the formation of social bonds around a coordinated task: a system of signs, a shared perception of the whole, and a clear structure of power. When viewed in this light, human political life—whose common task (the partnership in advantage and justice) arises because of its possession of logos and is supported (ideally) by the formation and distribution of offices—emerges as an extension of animal sociality, not an exception to it. I conclude by exploring the implications of this model of the intelligence of political animals for our understanding of Aristotle’s conception of human self-awareness. For while the individual crane may lack sufficient psychological complexity as to regard itself as good (and thus, for Aristotle, to regard itself at all), it must have some sense of the good of other cranes; that is, while it may lack self-regard, it must have other-regard. In this, it possesses the shared perception, the *sunaisthēsis*, that later traditions would see as foundational to Aristotle’s contribution to a history of consciousness.

‘Aristotle On Intra- and Inter-Species Friendship’
Thornton Lockwood

Recently, Fröding and Peterson (2011) have criticized Aristotle for allegedly denying that there can be friendships between human and nonhuman animals, and sought to reconstruct an Aristotelian account of utility friendship between human and nonhuman animals despite Aristotle’s allegedly dualistic zoological views. My paper shows the errors of such claims and instead shows that Aristotle had robust notions of both nonhuman intra-species friendships and inter-species friendships involving humans both in his zoological and ethical/political works. I reconstruct Aristotle’s notions of both kinds of friendships, explain their interrelation, and argue that he was correct to limit inter-species friendships between human and nonhuman animals to only utility and pleasure friendships.

‘Aristotle’s Ecology’
Devin Henry

Some scholars have attributed to Aristotle a “global interactive teleology” where the parts of nature are coordinated with one another in order to promote some common good (e.g. the good of the universe, the good of man). If this were true, then we would expect Aristotle’s biological works to be driven by a deep interest in ecology which emphasizes those kinds of mutual interactions. Yet, this is not what we find: Aristotle has no grasp of “the web of life”, no conception of an ecosystem, and he pays little attention to co-adaptations. However, it would be wrong to say that Aristotle’s biology is completely devoid of ecology; both the *HA* and *PA* show an interest in the various ecological factors driving behavioural and structural adaptations. In this paper I explore what I call Aristotle’s “ecological thinking”.

The bulk of the paper is focused on two of Aristotle’s central ecological concepts, *bios* and *topos*, both of which can be usefully close to our modern concept of a “niche”. Historically, a niche was conceptualized in spatial terms as a place in the environment into which species are “fitted”. Colwell (1992, 241) calls this the *environmental* niche concept because it treats a niche as a property of the environment with species as its occupants. A distinctive feature of the environmental niche concept is that it is possible for there to be empty or vacant niches since a niche (in this sense) is a place in ecological space that exists independently of the species that occupy it. This looks like the way *topos* functions in the *Historia animalium*. For example, in *HA* VII (VIII) 2 Aristotle says that animals are differentiated according to differences in their *topos* or “locality”. A *topos* in this sense is not simply the physical place where the animal is located but what we might call its habitat (e.g. swamp versus marsh). Like an environmental niche, a *topos* exists independently of the animals that occupy it; for example, a certain area counts as a “swamp” whether or not there are any animals living there. By contrast, a *bios* is a characteristic way of making a living (e.g. being an omnivore, hunting prey on the wing, living in social groups) and so cannot exist apart from the animal whose *bios* it is. This locates *bios* closer to what Colwell calls the *population* niche concept, which defines a niche as an attribute of a species *in relation* to its environment (e.g. hunting prey on the wing is way of finding food in the air used by flying animals). Since a niche (in this sense) is a property of animals, not the environment, it doesn’t make sense to talk about “empty niches” here. Likewise, since *bios* refers to an animal’s specific way of life, it would not make sense for Aristotle to talk about unexploited *bioi* out there waiting to be taken up by some species or other. Lewontin’s (1983) criticizes the environmental niche concept on these grounds. Instead, he advocates for a niche concept very much like Aristotle’s *bios* that defines it as a characteristic way of making a living.

While the *HA* has much more to say about ecology than the *PA*, the latter tells us how these ecological concepts function as a causal sense. In the final section of the paper I consider how these two ecological concepts function as causes. I argue that, while Aristotle was interested in ecology, this interest is not evidence of a global interactive teleology. At least in the case of *bios*, Aristotle’s focus remains on how this feature – along with the behavioural and

structural adaptations that exist for the sake of it – promotes that individual's *own* good. If this is right, then Aristotle's ecology is also best understood from what I have called the organism-centred perspective.

'Fat Sheep and Tasty Fish: Diet and nutrition in the *Historia animalium*'
Claire Bubb

Aristotle opens *History of Animals* by delineating the ways in which animals differ amongst themselves. The primary means of differentiation is in their parts, whether the homoeomerous or the compound; however, they also differ in terms of their ways of life, their activities, and their characters. This paper will query an area of overlap between these two groups, namely the role of diet in Aristotle's study. He foregrounds diet as a major differentiating element in *HA* Book VII, where he introduces it, along with character, as a defining factor in both ways of life and activities. Diet itself, at a broad level, is driven by a need for the food the animals consume to match the matter from which they are constituted. Aristotle indicates that the quality and contents of individuals' diets directly impact the qualities of the homoeomerous parts that constitute them and, thence, even their characters, which are dictated to some degree by the quality of their parts—e.g. the softness of their flesh or the purity of their blood. This paper explores two particular facets of diet foregrounded in *History of Animals*, contextualizing them in the system of nutrition outlined in the corpus more broadly. First, it queries Aristotle's repeated claims that water is a particularly fattening substance for grazing animals, like sheep. This position ends up being consistent with his widespread emphasis on fluids as the primary mechanism of nutrition. Second, it addresses Aristotle's frequent reference to the tastiness of animals in his descriptions of them. While this might seem a problematically anthropocentric criterion of evaluation, it is once again consistent with his broader nutritive framework. Animals' goal in digestion is to sort out the most useful parts of the foods they eat and then materially improve those parts through the process of concoction in order to raise them to a level of compatibility with their own flesh. Given Aristotle's hierarchical understanding of the *scala naturae*, the tastier an animal is to a human, the more appropriate it is to serve as useful nutritive matter to human flesh, which is objectively the best flesh. Thus, an individual animal's palatability is a meaningful indication of how good a specimen it is of its species, while a species' palatability marks its degree of success in the process of concoction—a process central to animal life.

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