

Aristotle's *clivus naturae*

As we read the early chapters of Book II of Aristotle's *de Anima*, as well as the later chapters of Book III, we come away with a strong image of what was later called his biological *scala naturae*: there are four distinct grades of soul, each one presupposing the grade below it. Plants have the nutritive soul; animals have, in addition, the sensitive soul, and most also the locomotive soul; humans, finally, have these three levels of soul plus the intellectual soul. It is the image of a ladder or staircase with four distinct treads.¹

This striking picture is at odds, though, with a well-known discussion in the *Historia Animalium*, VIII, 1, which considers an arrangement of living species in ascending order of vitality, and claims that the steps are so small between them that the ascent is virtually continuous. Indeed, some species are so close to the border between plant and animal that it is not certain on which side they fall (588b4-8).² This, then, is an image not of a *ladder* of nature, but of a *slope* of nature: not a *scala naturae* but a *clivus naturae*. There is, to say the least, a tension between these images. I want here to explore this tension.

I. The tidy staircase of de Anima II

The tenor of Aristotle's discussion in *de Anima* would seem generally to suggest that the four parts or levels of soul—the four souls—are, in addition to being cumulative, both indivisible and discrete. Let me spell out these properties more exactly.

a) Indivisibility

With one important exception, Aristotle appears to understand each of these parts of soul as indivisible—that is, not *actually* separable into parts. In thought, for example, we may distinguish the power of self-nutrition from the power of reproduction, but "nutrition and reproduction are due to one and the same psychic power" (ἡ αὐτὴ δύναμις τῆς ψυχῆς θρεπτικὴ καὶ γεννητικὴ) (416a18); the one is never found without the other. Again, he resists the idea that the locomotive power is divisible into mind and appetite, and insists that "that which moves therefore is a single faculty": ἐν δὲ τι τὸ κινουῦν (433a22). And mind, though notoriously divisible into active and passive parts or aspects, is nonetheless such that—among living mortals at least—the one part is never found without the other: thinking is divisible in thought, but not in fact.

The one significant exception to this indivisibility concerns the senses. Though all animals have the sense of touch (and taste, which is an extension of touch), not all have all the other senses;

¹ It is unclear exactly when the precise phrase *scala naturae* was first introduced. Plato (*Symposium* 211c) speaks of mounting steps (ἐπιαναβασμοὺς χρώμενον) toward the knowledge of Beauty Itself, but that is a hierarchy of delectables, not a hierarchy of nature. Galen speaks of nature having rungs or steps: *De semine* ii. 5: ὥσθ' οἶον βαθμούς τινας ἢ φύσις ἔοικεν ἔχειν (Galen 1992: 194). I am grateful to Sean Coughlin for his help here.

² This image of the continuous rise recurs, perhaps even more forcefully, at *de Partibus Animalium* IV, 5, 681a12-15: ἡ γὰρ φύσις μεταβαίνει συνεχῶς...

these latter "belong not to any and every kind of animal, but only to some; those capable of forward movement must have them...." (434b23).

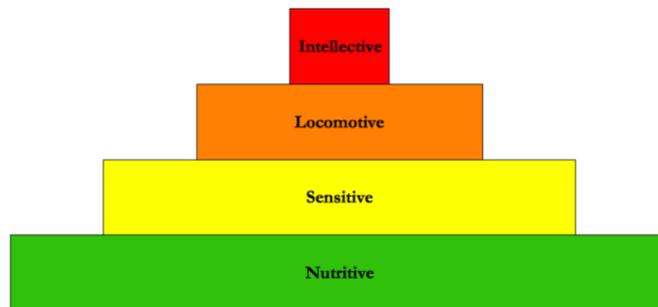
b) *Cumulativity*

Anything that has the sensitive soul must also have the nutritive soul; anything that has the locomotive soul must also have the sensitive soul; and anything that has the intellective soul must also have the sensitive soul. This point is made explicitly a number of times in these chapters, and reflected implicitly throughout. Perhaps the *locus classicus* is in Chapter 3:

...the power of perception is never found apart from the power of self-nutrition....Again, among living things that possess sense some have the power of locomotion, some not. Lastly...(among mortal beings) those which possess calculation have all the other powers above mentioned, while the converse does not hold.... (415a1ff)

c) *Discreteness*

The third feature of this staircase picture in *de Anima* is discreteness: though each level of soul presupposes the one below it, still Aristotle has in mind that each part or level of soul is a discrete package of powers. In *de Anima* III, 9, where he is negotiating various versions of the partition of soul—and he briefly entertains some uncertainty about his own quadripartite theory—he urges that the goal should be to establish *κεχωρισμένα μόρια τῆς ψυχῆς*—distinct parts of the soul (432b2).



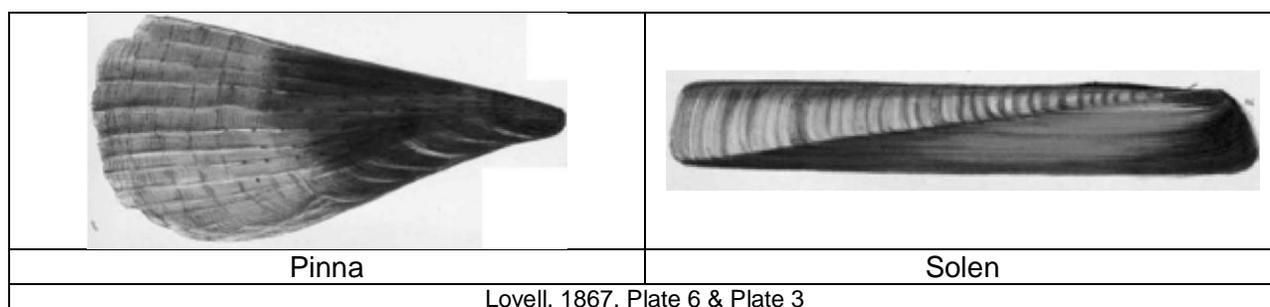
II *The slope of Historia Animalium VIII. 1*

The treatment of these matters in the first chapter of *Historia Animalium* VIII seems to cause this crisp and clean picture to crumble. In *de Anima* the discussion is, in a way, theoretical: it is about levels of soul, considered rather abstractly. In the *Historia Animalium*, by contrast, the discussion is of actual plants and animals: the facts on the ground. And, when we hit the facts on the ground, it seems that the lofty ideals of the theory fall apart. Indivisibility is compromised, cumulativity is diluted, and discreteness is violated.

Let us first consider several details of Aristotle's discussion in this chapter. First, there is the interesting claim that, among plants, one will differ from another as to the degree of its apparent vitality (*τῷ μᾶλλον δοκεῖν μετέχειν ζωῆς*) (588b8). Here, then, is an explicit statement that, within the category of plants—that is, within one level of soul—individual species may differ as to the amount or intensity of that soul that they possess. (I leave aside the question about *individual* variability, how different members of a given species may differ in vitality.) On the face of it this seems an odd idea. If the nutritive soul is the ability to nourish oneself and to reproduce, in what way can one species have more of that power than another? About this, we can only speculate,

but it is at least possible that what Aristotle had in mind was something of the following sort. Some plants, weeds for example, will grow very readily in a wide variety of conditions; these seem to be very adept at nourishing themselves: they do well in sandy soil or in clay, in dry seasons or in rainy seasons; they can find their nutriment anywhere. Others are much more finicky: orchids, for example, or mushrooms. Interestingly here (though I am no expert in these matters), plants that nourish themselves easily are generally easy to propagate: the self-nutritive capacity seems well matched with reproductive capacity. No wonder Aristotle thinks they are one and the same faculty.³

A second detail of the discussion in this chapter of *Historia Animalium* concerns that interesting class of animals which possess the sensitive soul but lack the locomotive soul: they can perceive things but cannot move around. He instances the pinna and the solen or razor clam, two bivalve mollusks that reputedly stay rooted to one place in the sea floor. He adds that, in general, the entire species of testacea (invertebrates with a hard shell) have a resemblance to vegetables (588b17).



One might wonder, here, how it is that Aristotle seems ready to include these among animals, that is, why he thinks that they have the faculty of sense. He is conscious of the problem:

In regard to sensibility, some animals give no indication whatsoever of it, whilst others indicate it but indistinctly (ἀμυδρῶς) (588b18)

Although it is hard to discern why he would impute animality to something whose sensibility cannot be detected, we do at least have an explicit assertion that sensibility is a matter of degree: some animals have more of it than others.

Moreover, he concludes this part of the discussion:

And so throughout the entire animal scale there is a graduated differentiation in amount of vitality and in capacity for motion (ἀεὶ δὲ κατὰ μικρὰν διαφορὰν ἕτερα πρὸ ἑτέρων ἤδη φαίνεται μᾶλλον ζῶν ἔχοντα καὶ κίνησιν) (588b21-23).

We have seen, then, that Aristotle, in the short span of a few paragraphs, commits himself to the view that the nutritive soul, the sensitive soul, and the locomotive soul are all subject to

³ It is a triumph of Aristotle's ingenuity that, in his analysis of human—and, presumably, mammalian—physiology, he is able to come up with a scheme that makes reproduction and nutrition different branches of the same bodily operation. The digestive system breaks down and refines food for the purpose of growing and replenishing the flesh; but more food is refined than is needed for this purpose, and the excess is further refined to become semen.

degree: one species may have more or less of it than another. And thus we face again the question: what sense can be made of having more or less of a given kind of soul?

We have already glimpsed a partial answer to this question, at least as far as botanical self-nutrition and reproduction are concerned: some plants are hardy, thriving under many different conditions, and others are more choosy; similarly some are easy to propagate, others more difficult. But, looking more broadly at the nutritive and reproductive soul, Aristotle probably has some other points in mind as well. He has the view, for example, that whereas animals generally take in food and then break it down in digestion to extract its useful parts, in the case of plants the nutriment is already broken down when it is ingested: that is why plants produce no excrement (*de Partibus Animalium* II, 3, 650a20-23) (Sherman 1933: 43). Plants and animals, that is to say, have different *mechanisms* for self-nutrition, and the mechanism in animals is more elaborate and more accomplished than that in plants. Moreover, among animal species, there are differences in the detail of these mechanisms. One species may have a more robust digestive apparatus than another: dogs can digest more kinds of food than snails.

There is variety, too, in methods of reproduction among both plants and animals. There is spontaneous generation, or as it is now more commonly known, abiogenesis. And there is also asexual generation, at least among some fish and among some insects, notably bees. Moreover, among animals that reproduce sexually, some are oviparous and others are viviparous. Surely these different methods of reproduction would play somehow into the account of the degree of vitality that these different species possess.

a) Indivisibility

Now all of this bears on the idea, suggested in the *de Anima* texts, that the different souls, or parts of soul, are indivisible. For, under the heading of nutrition and reproduction, different species have different powers, different abilities. Animals ingest and digest; plants cannot digest but only ingest. Some plants and animals can fecundate themselves; others can only fecundate others. (Some, indeed may be fecundated by the wind! (*Historia Animalium* 572a13)) Some can grow an embryo inside themselves, others cannot. And so on. In other words, the nutritive soul subdivides into many different powers; some species have more of these powers than others; some have different powers from others. The nutritive soul is not uniform; it breaks down into parts, and these parts are present in greater or lesser degree in different species. The nutritive soul is divisible not only in thought, but also in fact: the nutritive soul is *not indivisible*.

And one quickly sees that the same general lesson will apply to the sensitive and the locomotive souls. The sensitive soul, in addition to the five (or seven, or eight) special senses, includes common sense, memory, dreaming, and imagination. It includes pain and pleasure, and, presumably also what we now call body-sense—a kind of sensation of which Aristotle is clearly aware, but whose functioning he makes no attempt to explain: twinges and tickles, shivers and itches, hunger and tiredness, etc. Different species of animal will have different capacities with respect to all these sensory possibilities. And, in locomotion, some species can move in three dimensions, others only in two; some can move on land or in water or in the air, others in only one or in two of these; some can move gracefully and at speed, like cheetahs, others, like turtles, only lumberingly and slowly. And so forth. The sensitive soul and the locomotive soul have parts or powers that are separable not only in thought but in reality; these souls are *not indivisible*.

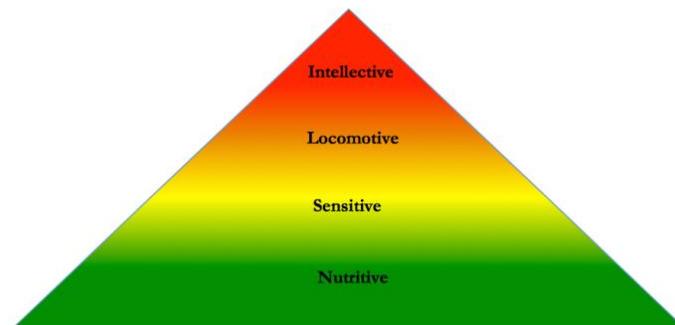
b) Cumulativity

There are two sorts of cumulativity, which we might call total and partial, respectively. When I was a boy the school system was structured in such a way that one had to pass *all* the subjects

of a Grade in order to be promoted to the next Grade. If one missed even one of the Grade 6 subjects one would have to repeat the year. This was total cumulativity: you had to meet *the totality* the requirements of one level in order to progress to the next. Partial cumulativity would be more relaxed: if you missed a subject in Grade 6, you could still move on to Grade 7, but would somehow have to work up the missed subject from the previous year. Total cumulativity is like a staircase: the full riser must be in place before the next tread is laid; partial cumulativity is like a slope; the stair tread is inclined; in Grade 7 you are still working on some Grade 6 requirements. The model of cumulativity in the *de Anima* texts, with its image of a staircase, looks like total cumulativity. But we have seen enough of the discussion in the *Historia Animalium* to see that the true model is partial cumulativity. An animal may possess the locomotive soul, for example, without having a robust sensitive soul. Moles move from place to place even though they have barely any sense of sight (*Historia Animalium* 533a4-15); their sensitive soul is incomplete, but that does not stop them from partaking of locomotive soul.

c) Discreteness

We also learn, from these more empirical discussions, that the four levels of soul are not discrete. The higher levels of soul may make use of parts or aspects of the lower; and the lower levels of soul may be enhanced by the presence of the higher levels. Thus, for example, locomotion is not possible without the presence of some power to sense distant objects, i.e. without the presence of some senses other than touch and taste (*de Anima* 434b23-30). And, on the other side, sensation greatly enriches procreation: it increases the pleasure of intercourse, and, if the sensitive faculty includes memory, it allows for some degree of social organization in the rearing of young (*Historia Animalium* 588b27-589a2). And, though I am not aware that Aristotle himself makes this point explicitly, sensation would presumably allow an animal to avoid ingesting poison: it would thus improve the operation of the nutritive faculty: such discrimination of nutrient would not be available to a plant, lacking, as it does, the sensitive soul.



III The metaphysical stakes

All of this is, no doubt, interesting enough as a matter of the history of science: a famous phrase, *scala naturae*, seems an inaccurate portrayal of Aristotle's true understanding of matters, at least matters as they are empirically encountered; a more appropriate phrase would be *clivus naturae*.

But there is rather more than this at stake. Two important questions arise.

(i) The first is a question of ontological priority. Is Aristotle a realist or a nominalist about the four fundamental parts or faculties of soul? Is there a big entity called "nutritive soul" that inhabits living things and expresses itself in various ways? Or is it rather that the phrase "nutritive soul" is a convenient way of gathering and labelling a clutch of physiological processes, differing in detail from one species to another? To put it another way: is it the staircase image or the slope image that represents the deep ontology here?

This question, as it happens, comes into sharp focus in the very first text that I have cited in this paper. Speaking about the nutritive and reproductive powers of living things, Aristotle writes: ἡ αὐτὴ δύναμις τῆς ψυχῆς θρεπτικὴ καὶ γεννητικὴ (*de Anima* 416a18); Smith, in the canonical Oxford translation, renders this as: "nutrition and reproduction are due to one and the same psychic power". Note, however, that there is nothing in the Greek to justify the words "due to": Smith is reading in a realist understanding of matters where none is justified; the text just says that the nutritive and reproductive powers are one and the same.⁴ And we have seen that they are one and the same because they are parts of the same physiological mechanism. So it is a good use of words—*nomina*—to unite these processes under one label. Smith's embroidery of the translation arouses my suspicions.

(ii) More significant is the question of the intellective soul. The idea that intellective soul, the distinguishing soul of humankind, is a discrete entity, a disruption in the continuity of nature's slope, has been a main strand in the Christian world-view. It has often been thought to derive from Aristotle, and although it can be supported by several of Aristotle's remarks, we have here seen some evidence that his true allegiance may be to the continuous slope, rather than to the bumpy staircase. This would make quite a difference.

John Thorp
Department of Philosophy
The University of Western Ontario
London, Ontario, Canada

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⁴ This rendering has not been altered in *The Revised Oxford Translation*.

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