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Aristotle on the Good of Reproduction

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Abstract: This paper discusses Aristotle's theory of reproduction: specifically, the good that he thinks organisms attain by reproducing. The aim of this paper is to refute the widespread theory that Aristotle believes plants and animals reproduce for the sake of attenuated immortality. This interpretive claim plays an important role in supporting one leading interpretation of Aristotle's teleology: the theory that Aristotelian nature is teleologically oriented with a view solely to what benefits individual organisms, and what benefits the organism is its survival and well-being. This paper challenges the theories that Aristotle takes plants and animals to reproduce for the sake of attenuated immortality, and that he believes survival to be the most basic of goods. It is argued that Aristotle believes reproduction is detrimental to organisms' health and longevity but nonetheless is central to plant and animal flourishing. It is claimed that, to explain the fundamentality of the reproductive soul function, Aristotle appeals to the eternal and divine.

Keywords: final cause, reproduction, nutrition, survival, immortality

There is a common view among scholars that Aristotle believes reproduction is the means for *an individual* organism to survive eternally due to the persistence of its form. For example, David Balme writes that reproduction "is the *individual's* attempt to preserve its own form—i. e. to survive."¹ Monte Ransome Johnson argues that it benefits the individual organism by offering it "a kind of attenuated immortality."² Ron Polansky asserts that it allows a plant or animal to preserve "*its own life* as much as it can."³ Gabriel Richardson Lear states that "the immortality *of the particular* creature is its *telos*."⁴ Devin Henry holds that reproduction is significant because "it grants the *individual* access to the 'immortal and divine.'"⁵ And, as a final example, Stasinos Stavrianeas

¹ Balme (1987).

² Johnson (2005, 149 and 174).

³ Polansky (2007, 205).

⁴ Lear (2004, 81). The italics are my emphasis.

⁵ Henry (2015, 206).

explains that “creating an offspring like themselves in kind, *prolongs their existence in a such a way that they participate in the attributes of being eternal*, not as an individual but in kind.”⁶

This thesis that organisms reproduce for the sake of their immortality (hereafter called the RI thesis) plays an important role supporting one leading interpretation of Aristotle’s teleology: the theory that Aristotelian nature is teleologically oriented with a view solely to what benefits individual organisms, where what benefits the organism is its survival and well-being.⁷ In this interpretation, teleological explanations are limited to the features and behaviors of organisms: the structures and faculties of the soul, the organs that serve the faculties’ function, and the organisms’ movements. Denied is that some good beyond the organism—i. e. god or some cosmic order—serves as a final cause orchestrating the cosmos’ goodness and permanence.⁸ A cosmic or global teleology, wherein plants and animals are adapted for the sake of some cosmic good, risks privileging the higher good at the expense of the individual organism. That is why proponents of this interpretive line often reject the notion that goods external to individual organisms enter into Aristotle’s biological explanations as final causes and ordering principles.

The RI thesis is critical to the so-called ‘organism-centered’⁹ interpretation because it allows its defenders to explain away Aristotle’s assertion in *DA* ii 4 that plants and animals reproduce in order to partake in the eternal and divine (415a29). In this interpretation, “the eternal and divine” does not refer to some being towards which plants and animals strive, but represents some good that stands to benefit the reproducing organism: namely, survival via the persistence of its form. The implication is that survival drives the reproductive enterprise and delimits teleological explanations to the structures and features of organisms. As the most basic of goods, no cosmic teleological explanation can conflict with it and no prior principle, not even god, is necessary to explain it.

6 Stavrianeas (2018).

7 It must be emphasized that not all scholars who attribute the RI thesis to Aristotle are similarly willing to attribute to him an organism-centered teleology. D. Sedley, who attributes an anthropocentric teleology to Aristotle, offers a case in point. See Sedley (1991, 194). Henry also allows that generation has a global teleological significance, though he denies that natures are adjusted in light of some cosmic good. Henry sees Aristotle as embracing a “weaker version of the organism-centered view than has been ascribed to him.” *Ibid.*, 102.

8 For an anthropocentric reading of Aristotle’s teleology, see Sedley (1991). For the view that Aristotle posits a final cause to explain the permanence of the cosmos or eternity of the species, see Furley (1996) and Cooper (1982).

9 So named, I believe, by Henry, *op. cit.*

The aim of this paper is to contest the attribution of the RI thesis to Aristotle and promote a cosmic reading of his teleology. I argue the following: that it is Aristotle's view that plants and animals reproduce to the detriment of their physical health and longevity; that reproduction and nutrition do not share the end of survival; and that Aristotle does not recognize survival (whether of the composite or the organism's form) as the most primary of goods for the individual organism. Nonetheless, I do not advocate an interactive or cosmic reading whereby plants and animals are adapted for the sake of some cosmic good to the detriment of their life and well-being. Aristotle consistently assumes that the ends of a plant or an animal promote its good, and asserts in the *Progression of Animals* that this supposition lies at the foundation of the biological sciences.¹⁰ I propose that Aristotle regards reproduction as more central to the organism's flourishing than the use of food for its own preservation; that he believes nutrition is for the sake of reproduction; and that he appeals to the eternal and divine to explain why the activity of reproduction has a privileged place in the natural world.

Three passages are routinely cited in defense of the RI thesis: *GC* ii 10, 336b25–7a7; *GA* ii 1, 731b18–732a11; and *DA* ii 4, 415a22–b7. Each passage establishes the end of reproduction, and each ostensibly posits the divine as its final cause. I focus on the *DA* and *GC* passages, taking the *DA* passage as the starting-point of this essay. I proceed as follows. In the first section of the paper, I review the evidence for the RI thesis in the *DA* passage. In the second, I turn to the biological works to argue that Aristotle believes reproduction weakens organisms and hastens their death. The aims of this section are to expose the challenge that reproduction posed to Aristotle, open the space for an alternative reading of reproduction's end, and lay the grounds for later arguments against the RI thesis. In the third section, I present evidence for the view that Aristotle believes reproduction affords plants and animals a unique good, distinct from and more foundational than self-maintenance and continued existence. In the fourth, I revisit the RI thesis to illustrate its problems. And in the fifth and last section, I describe the relationship of the faculty of reproduction to the eternal and divine, mentioned in *DA* ii 4, at line 415a29. As a final note, I give special attention to Monte Ransome Johnson's treatment of these passages from his manuscript *Aristotle on Teleology*. Attributing the RI thesis to Aristotle is so commonplace that scholars tend to impute it to him with little justification. Johnson, by contrast, provides a compelling and comprehensive argument for the attribution of this thesis to Aristotle in support of his organism-centered interpretation. Therefore, his arguments deserve our careful consideration.

¹⁰ See *Ph.* 198b5–9 and *IA* ii, 704b15–17.

Evidence for the RI Thesis: *DA* ii 4, 415a22–b7

The *De Anima* passage appears at the very beginning of Aristotle's discussion of the nutritive soul (ἡ θρεπτικὴ ψυχὴ) in Book Two, Chapter Four:

Consequently, we must speak about the capacity of the soul that concerns nutrition and reproduction. For the nutritive soul is found with all the others, and is the first and most common faculty of the soul (πρώτη καὶ κοινοτάτη) in virtue of which living belongs to all things. Its functions are reproduction and the use of food; for the most natural of functions in living beings (φυσικώτατον γὰρ τῶν ἔργων τοῖς ζῶσιν), whatsoever has achieved maturity and is not deformed or spontaneously generated, is to produce another such as itself, animal producing an animal, plant producing a plant, in order that it may partake in the eternal and divine insofar as it is able (ἵνα τοῦ ἀεὶ καὶ τοῦ θεοῦ μετέχωσιν ἢ δύνανται). For all things strive for it, and it is that for the sake of which they do whatsoever they do according to nature (for the sake of which is double, there is that for which and that to which). Since then it is not possible to partake in the eternal and divine by continual existence, because nothing perishable is able to remain the same and one in number, each partakes <in the eternal and divine> insofar as it is able, sharing in this way, some more some less, and each remains not itself but such as itself, not one in number, but one in form. (415a22–b7)

Broadly speaking, Aristotle establishes two things in the above passage. He first establishes *that* reproduction is a function of the nutritive soul. That reproduction belongs to the same faculty as nutrition would not have been obvious to Aristotle's contemporaries. Reproduction involves a different set of organs from nutrition; the ends of the two enterprises are not obviously the same; and a sizable number of plants and animals were thought capable of procuring nourishment though incapable of producing offspring of the same kind. Indeed, there was precedence for regarding the reproductive and nutritive faculties as distinct. In the *Timaeus*, Plato treats the reproductive system as a "living thing" within the individual: a system of organs operating independently from those involved in our desire for food and drink (91a2, c2). Aristotle second establishes *why* reproduction belongs to the nutritive soul. His explanation appeals to the end of reproduction: the good that organisms stands to gain by reproducing. It is Aristotle's view that soul functions are ends of ensouled bodies (415b10–12), and that natural ends are good on the grounds that nature does nothing in vain.¹¹ In the above passage, the end of reproduction is given as the grounds for situating

¹¹ For the claim that nature is for the sake of the better example, see for instance, *Ph.* ii 4, 194a28–33; *Ph.* ii 7, 198b8–9; *De An.* iii 12, 434a31–b6, *PA* i 5, 645a23–6, *IA* 704b15, and *GA* ii 4, 738a37–b1.

the reproductive soul function within the most common type of soul: the nutritive soul. Let us take a closer look at his arguments.

Aristotle establishes that reproduction belongs to the nutritive soul, first by demonstrating that the nutritive soul is responsible for the capacities that are fundamental to life, and next by showing that reproduction is one such capacity. Aristotle points to the fact that all living beings have a nutritive soul in order to establish its fundamentality: to establish that the possession of this faculty sets the boundary between the living and the lifeless. He writes:

For the nutritive soul is found with all the others, and is the first and most common faculty of the soul, in virtue of which living belongs to all things. (415a23–25)

He then situates the reproductive capacity within this faculty by arguing that “the most natural of functions in living beings” (φυσικώτατον γὰρ τῶν ἔργων τοῖς ζῶσιν, 415a26–27) is to reproduce.

The RI thesis is taken to be Aristotle’s explanation of why reproduction belongs to the nutritive soul—that is, why reproduction is “the most natural of functions.” Specifically, it is an interpretation of the following sentence:

[F]or the most natural of functions in living beings, whatsoever has achieved maturity and is not deformed or spontaneously generated, is to produce another such as itself, animal producing an animal, plant producing a plant, in order that it may partake in the eternal and divine insofar as it is able. (415a26–b1)

Here we are told that plants and animals reproduce in order to partake in the eternal and divine, but Aristotle does not indicate precisely what he means by this. Those who attribute the RI thesis to Aristotle look to the last clause of the last sentence of our passage for evidence of its meaning. There Aristotle states that by reproducing “each remains not itself but such as itself, not one in number, but one in form” (415b6–7). Proponents of the organism-centered interpretation take this remark to articulate the good individual organisms attain by reproducing.¹² It is argued that

¹² Aristotle’s claim that plants and animals reproduce for the sake of the eternal and divine harkens back to Plato’s *Symposium*, wherein Plato has Socrates defend the thesis that animals reproduce for the sake of immortality. There can be no question that Plato adopted the RI thesis. He has Socrates offer a two-pronged defense of the claim. Plato’s Socrates argues that (i) only the promise of immortality can explain the risks animals take to reproduce and (ii) the mechanism that allows a person to remain the same through time and change is the very mechanism that allows a person to persist in and through his offspring. But even though Aristotle is clearly inspired by Plato’s account of generation, we cannot simply assume that Aristotle understood the benefit of reproduction—i. e. participation in the eternal and divine—in the same way. Plato’s explanation of how organisms survive through their offspring is undergirded by an embryology that Aristotle rejects. (For a thorough discussion of Plato’s embryology

the immortality obtained is attenuated (i. e. that organisms survive through the persistence of their species-specific form) because Aristotle states unambiguously that the individual, understood as a composite of form and matter, neither survives nor reproduces itself (415b4–5, 416b16–17, 731b31–33).¹³

Johnson's contribution to this interpretation of the *De Anima* passage is to embed what he sees as Aristotle's commitment to the RI thesis within a comprehensive theory of his teleology. In a nutshell, that theory posits cyclical teleological activity—whether the motion of the heavenly spheres, the reciprocal transformation of the elements, or the continuous generation of organisms—benefits individual actors by enabling them to perpetuate their existence.¹⁴ Johnson appeals to

in the *Timaeus*, see Wilberding (2015)). Furthermore, Plato has Socrates posit the RI thesis to motivate ethical and political ideals that Aristotle simply does not accept. For instance, Plato uses the RI thesis to show that reproducing and philosophizing afford the individual the same good, but to different degrees. This allows Plato to argue that certain individuals are better off pursuing the philosophical life and abandoning the quest for a family. Arguably, it is this move that allows Plato's Socrates to argue in the *Republic* that the guardians are served by giving their children to nurses to be raised. By contrast, Aristotle views the household as the cornerstone of the *polis*. He takes pains to reject Plato's theory of shared property, wives, and children in Book II of the *Politics*.

13 The reason that the progenitor (by which here I mean the father, who is the principle begetter) does not survive as an individual by reproducing is that he does not pass along his soul to his offspring. Aristotle's view is that the male provides the active principle of generation, i. e. the principle of movement, and the female provides the passive principle, i. e. the material upon which the semen works (729b10–14). And while Aristotle says that the soul of the embryo comes from the male (738b26), he does not mean that the male conveys his soul to the embryo. The Aristotelian soul is inseparable from body and, therefore, cannot be conveyed without also conveying body. Aristotle denies that the male contributes body to the embryo (729b10–11). Using his favored analogy—the comparison a carpenter's tool to semen—Aristotle explains that the maker's form is imparted to its material by means of movements. As the carpenter uses his hands as tools, tools which are moved by the knowledge of his art, so too does the male's nutritive soul use the semen as a tool, a tool moved by the same movements involved in the growth and sustenance of the father (730b8–24).

14 Johnson writes: "Just like the other natural bodies, stars, and elements, which perpetuate their existence eternally and thus manifest their divine aspect (either through continuous circular motion, or through imitation of this in continuous reciprocal transmutation), organisms too exist for the sake of—aim of—eternal existence, and so this is the primary source of explanatory information about them. Organisms are unlike stars in that they must reproduce in kind in order to survive eternally, but they are also unlike the terrestrial elements in that they are alive. From this standpoint the fact that the soul exists primarily both for the sake of living and for the sake of a living organism is not a problem, since the same soul—the nutritive soul—manifests both functions, living and reproducing." Johnson (2005, 173 f.). It is worth noting that the celestial bodies—the stars, plants, sun, and moon—do not move (*DC* ii 8). Johnson recognizes this, explaining that the fixed stars are embedded in the spheres. But he nonetheless speaks of all the stars (including the planets, sun, and moon) on p. 270 as "motivated by the

Aristotle's distinction between final causes in support of his interpretation. I largely agree with his understanding of the distinction, although not with the conclusions he draws from it, as we will see later in this paper.

There are at least five occasions where Aristotle asserts 'that for the sake of which' has two referents (*Ph.* ii 2 194a35–6, *DA* ii 4 415b2–3, 415b20–1, *Meta.* xii 7 1072b1–4, *EE* vii 15, 1249b15). It can refer to the aim toward which some movement is directed and for which the goal-directed entity (or part thereof) exists (οὗ ἕνεκά τινος), or it can refer to the beneficiary of the goal-directed movement or activity (οὗ ἕνεκά τινι). At *DA* 415b20, Aristotle explains that the soul's functions serve as ends in the sense of οὗ ἕνεκά τινος; as the end towards which the organs' capacities are directed and the reason why the organs exist as such. Aristotle makes clear in the *Metaphysics* that ends of this sort can also be external to the moving agent, but common to all is that they are unmoved (1072b1–3). Aristotle indicates that the outermost heavenly sphere (and perhaps the inner spheres as well) has god as its end (οὗ ἕνεκά τινος), and implies at *EE* 1249b15 that god is a final cause of our theoretical faculty because it needs nothing. By contrast, the beneficiary of the goal-directed motion—that for whose benefit the goal-directed behavior exists—is the agent of the goal-directed behavior or motion. The idea is that the agents of goal-directed behavior benefit by achieving ends that are good. The agent can be the composite organism or even the soul function alone. Both benefit by the realization of ends that are good: the organism because it achieves the good, and the soul because its existence and realization depends upon the goal-directed activity of the body.¹⁵

Johnson appeals to the ambiguity of final causes to argue that the aim (οὗ ἕνεκά τινος) of all cyclical motion is the unchanging, practicable good of immortality; the beneficiary is the moving entity (οὗ ἕνεκά τινι), which stands to gain by attaining some degree of continued existence. Johnson argues that unchanging entities such as god and abstract goods such as cosmic harmony or eternal forms can neither be the end as aim (οὗ ἕνεκά τινος) nor the end as beneficiary (οὗ ἕνεκά τινι) of motion.¹⁶ God, cosmic harmony, eternal forms:

perfection and eternality of the unmoved mover(s)" and "[wanting] to imitate the eternal activity of the unmoved mover(s)." I find strange the notion that the spheres perpetuate their existence through circular motion. If the embedded bodies do not perpetuate their own existence through the agency of their circular activity, there is no reason to think that circular activity is the *means* to eternal living for embodied entities.

¹⁵ T. K. Johansen's explanation of Aristotle's distinction between final causes aligns well with Johnson's. Johansen (2015, 119–25).

¹⁶ See Johnson (2005, 267–71). Here Johnson responds to the view that Aristotle's god serves as the paradigmatic being in actuality, whose role in the natural world is to drive all potentialities to realization. For this view, see Kahn (1985), Kullman (1985), and Sedley (1991).

these cannot be the end as aim (οὐ ἕνεκά τινας) because *qua* god, *qua* cosmic harmony, *qua* eternal forms, they offer organisms no incentive to act. Johnson says that the end as aim must be a practicable good: some good that is useful to the moving entity. Thus Johnson argues that practicable goods drive Aristotle's teleology so that without them "there would be no stellar rotation, no elemental transmutation, and no animal or human motion."¹⁷ Johnson suggests that references to the divine in connection with reproduction are meant only to highlight the resemblance of reproduction's aim (i. e. attenuated immortality) to the aim of heavenly rotation (i. e. eternity). He reminds us that resemblance requires no "mysterious, metaphysical sense of 'imitation."¹⁸ But just as significant, in Johnson's view, eternal entities and states of affairs cannot be the beneficiaries of goal-directed movements or activity. Johnson insists that unchanging, eternal entities are incapable of being 'that for the sake of which' *qua* beneficiary (οὐ ἕνεκά τινα) because an entity must be capable of change to be benefited.¹⁹

When it comes to reproduction, Johnson argues that the practicable good of immortality explains not only why plants and animals reproduce, but also why the reproductive soul function belongs to the same faculty as the nutritive soul function. Johnson writes:

[T]he ultimate reason why the animal reproduces is the same reason it survives, as a kind. That is, on an ultimate teleological level, because it is better to exist than not to exist, and what is necessary (and for some organisms sufficient) for this is the activity of vegetative soul. That is why Aristotle locates the functions of nutrition and reproduction in the same soul, the vegetative soul that is shared in common with plants.²⁰

Here Johnson tells us that, in Aristotle's view, plants and animals reproduce for the same reason they seek and use food: because both soul functions enable

¹⁷ Johnson (2005, 270).

¹⁸ Johnson (2005, 148). Note Richardson Lear applies this approach to natural philosophy to Aristotle's ethics. Richardson Lear (2004, chapters 4 and 5).

¹⁹ Cf. Johansen (2015, 126–27). Johansen suggests that it is the species that participates in the eternal and divine and the species that benefits from the goal-directed activity. He suggests that the organisms benefit derivatively: "one may think of the species distributively and say that the species enjoys immortality in the sense that each and every one of its members enjoy its own existence." I find Johansen's position unsatisfying. Presumably, the benefit the individual receives, existence, is owed to the fact that reproducing belongs to the nature of organisms. But as a result, the organism does not benefit from realizing its own potentially. In this rendering of the two final causes, an individual organism stands to gain by having the nature to reproduce but not realizing it. In other words, the individual organism benefits by being born, but not by producing offspring.

²⁰ Johnson (2005, 177).

organisms to continue their existence. Johnson maintains that Aristotle situates reproduction and nutrition within the nutritive soul—the primary and most common soul—because there is no more basic good than existence. In defense of this last claim, Johnson appeals to Aristotle’s repeated maxim that being is better than not being (*GC* ii 10, 336b28–29; *GA* ii 1, 731b30–31). The implication of this interpretation is that nothing adverse to organisms’ survival can be, in Johnson’s words, “positively involved in a natural teleological explanation of the organism at hand.”²¹ An organism, he writes, “lives for the sake of its own survival”²² and thereby cannot exist in any way for the sake of another. Johnson takes this to be further argument against the cosmic—and more precisely, the anthropocentric—interpretation of Aristotle’s teleology.²³

I will take up Johnson’s argument against cosmic interpretations of Aristotle’s teleology in the final section of this paper. The aim of the following *three* sections is to refute the claim that reproduction is the most natural of functions because it enables the organism to survive and present a case for an alternative reading. I begin by turning to the biological works to show that Aristotle represents reproduction as a labor-intensive enterprise for both the males and females of the species: an enterprise that compromises organisms’ physical health and curtails their lifespan.

The Physical Risks and Harms of Reproducing

The *History of Animals* provides various and sundry reports of the ways in which procreation compromises the physical well-being of the progenitors. Some of the harms do not have lasting consequences, and speak only to the labor and stress of the reproductive enterprise. For example, Aristotle reports that copulation is

²¹ Johnson (2005, 178 and 232–33).

²² Johnson (2005, 178).

²³ It is worth emphasizing that neither Sedley nor Cooper, who both argue that the nature of plants and animals serve higher ends, would deny that individual organisms are served by their nature. Sedley maintains that the nature of deer, say, serves both the species and some higher end. He writes: “A deer *per se* grows in order to become a mature deer; but deer grow *where and when they regularly do* in order to feed man. Thus all the good ends served are indeed those of individual species, but in each case the ends of the higher species play an orchestrating role.” Sedley (1991, 191.) Cooper, for his part, argues that if the preservation of the species is the end for which all natures serve, then natures must be beneficial to the individual organisms. He explains: “the normal member of each kind must be viable in its natural habitat; it must grow to adulthood, preserve itself for some normal period and arrange for the continuance of the species through successful reproductive activities.” Cooper (1982, 216 f.).

painful for the ash-colored heron, the oxen (*HA* vi, 575b29–30), and the hind (*HA* vi, 578b6–8). In fact, intercourse is so bad for this heron that she shrieks when she submits to the male and blood drips from her eyes (*HA* ix, 609b23–25; 616b33–34). We learn gestation wears down all fish, which is why they are apt to be cast ashore during this time (*HA* vi, 570b3–4). Aristotle says some fish suffer so much during gestation that they “throw themselves on land” (*HA* vi, 570b5).²⁴ He notes that spawning is painful for the cuttlefish; that birthing is laborious for the human female and the elephant (*HA* vi, 578a21–22); and that brooding, feeding, and suckling leave animals (mostly the female of the species but many male fish and birds, as well)²⁵ weak and attenuated because they forgo their own nutritional needs to protect and feed their young.²⁶

Save for the poor fish cast ashore, the reported pains associated with reproducing are relatively short-lived, and should not jeopardize the long-term health of the parent. But according to Aristotle, procreating invariably does just that. In some cases, the offspring themselves bring about the parents’ early demise. Land-scorpions and certain types of spiders (both male and female) are reportedly killed by their offspring as soon as they reach maturity. Aristotle does not explain why the young are so driven, but we can speculate what he takes the reason to be from his discussion of eagles. We are told that eagles eject their young from the nest before they can fly because food is hard to obtain and the competition for food increases with the new generation of birds (*HA* ix, 619a29–31; b26–31). Therefore, we can assume that by Aristotle’s estimation reproducing introduces a potentially serious threat. And the fact that parents do not often kill their young is no indication of the threat’s severity. Aristotle explains that fondness for one’s offspring is a feature of nature (*GA* iii, 753a7–17). In his view, animals that put their young in harm’s way have a “character flaw.” For example, eagles are particularly jealous creatures. They cannot stand to see their offspring develop hearty appetites because they fear having less for themselves (*HA* ix, 619b27–8).

More often than matricide and patricide, it is fecundity that brings about the parents’ earlier than physically necessary demise. Aristotle reports that fruit-bearing trees and certain types of hens die after overly abundant reproductive seasons (*GA* iii 1, 750a22; *HA* vi 1, 558b20–21). But for many species of plants and animals, fecundity is not a quirk: it is a part of their nature. And it is for this

²⁴ Admittedly, most of these descriptions run counter to Aristotle’s claim that “what is in conformity with nature is pleasant (*HA* vii, 589a8),” and so may be the exception to the rule, not the norm.

²⁵ See *HA* vi 4, 8, 14, and ix 7.

²⁶ See 544a3–15, 563a17–26, and 595b3–5.

reason that these species do not live beyond a single reproductive cycle. Aristotle reports that insects such as grasshoppers and locusts, certain types of reptiles, and cephalopods including cuttlefish, octopuses, and calamari all die after laying or fertilizing copious amounts of eggs.²⁷ This is also the case with annuals and leguminous plants like corn (*GA* iii, 750a24–25). And, by his account, it is not just the female of the species who is harmed by their natural fecundity. The male is as well.

The reason for the adverse relationship between fertility and lifespan is that the reproductive material of both males and females is produced from the organism's blood (or analogous material).²⁸ Blood is a useful nutriment. Flesh and organs are created from blood, and blood replenishes and sustains the developed body. Therefore, the production of seed, semen, and menses diverts useful nutriment away from the parent organism for the sake of the future offspring (*GA* iii, 749b27–28, 750a20–21). The result is a drying out and cooling of the body, which can prematurely age the individual (especially if the animal is unusually salacious or fertile (466b7–9)), and even bring about its immediate demise. To Aristotle's mind, this feature of reproduction—that seeds and menses are concocted from useful nutriment—explains why mules (infertile creatures) live longer than donkeys and horses, the latter of which are the most salacious of animals after humans (*HA* vi, 575b30–31).²⁹ It explains why oversexed men and women who have born many children “age quickly and fail to fully develop” (*HA* vii, 582a21–23). It explains why cock-sparrows and males used for breeding generally have shorter lives than their female counterparts (*HA* vi, 576b2–3) despite the fact that males possess more heat and moisture (two conditions of life). And it also explains why octopuses lose all their vitality after laying and fertilizing their eggs. Aristotle's description of the octopus after parturition offers us a particularly vivid picture of its desiccation and demise:

The octopus as a rule does not live the year out. It has a natural tendency to run off its liquid; for, if kneaded, it keeps losing substance and at last disappears. The female after parturition is peculiarly subject to this: it becomes stupid; if tossed about by waves, it submits impassively; a man, if he dived, could catch it with the hand; it gets covered over with slime and makes no effort to catch its wonted prey. The male becomes leathery and

²⁷ See *HA* v 28, 29, 33 and *HA* ix 37.

²⁸ Insects are bloodless and do not generate sperm. The males engender life in the female's reproductive material by means of their movement during copulation. But because this takes considerable effort, loss of heat and moisture also results.

²⁹ According to Aristotle, mules reportedly live up to eighty years (*HA* vi, 577b28–30). Horses live at most fifty years, but usually they live between eighteen and twenty years (*HA* vi, 576a26–28).

clammy ... After the eggs are laid, they say that both the male and the female grow so old and feeble that they are preyed upon by little fish, and with ease dragged from their holes; and that this could not have been done previously. (*HA* ix, 32, 622a14–29, trans. Thompson)³⁰

Yet it is not just highly fertile organisms that are weakened by the reproductive enterprise. According to Aristotle, even the smallest amount of sperm created and emitted depletes a person of energy and vigor:

[T]he exhaustion consequent on the loss of even a very little of the semen is conspicuous because the body is deprived of the ultimate gain drawn from the nutriment. With some persons, it is true, during a short time in the flower of their youth the loss of it, if it be excessive in quantity, is an alleviation ... still in most men and as a general rule the result of intercourse is exhaustion and weakness rather than relief. (*GA* i 18, 725b6–18, trans. A Platt)

This is bad news for animals like the wild boar, ram, and he-goat that compete aggressively to mate. Weakened by copulation but still combative, Aristotle reports that it is not uncommon for these animals to die from injuries sustained during their fights (*HA* vi 18, 571b13–21).

Still it is fair to ask whether there is a real cost in terms of the health and lifespan for most animals. It could be that, in Aristotle's view, reproduction impacts lifespan only when the organism is imperfect in its nature: either when it is dry or cold by nature (like insects or cephalopods who have little warmth and moisture to spare) or when it is overly salacious so that its early demise is a consequence of some defect of "character." Yet castration tells a different story. Aristotle reports that bellwethers grow to be more robust and to live longer lives than those left to go about their natural business; that castrated bulls live to an "exceptionally advanced age, owing to the exemption from hardship" (*HA* vi, 575b2–3 trans. Thompson), by which he means copulation; that castrated rams live up to fifteen years, which is at least five more years (or fifty-percent longer) than their counterparts (*HA* vi, 573b23–25); that sows, who have their ovaries removed, become fat (*HA* ix, 632a21–2); that wild boars, when accidentally castrated, grow "larger and fiercer" (578a32–33); and "in general," that "all castrated animals become larger than those not cut" (*HA* ix, 632a31–2). Finally, consider the rumor, recorded in the *History of Animals*, that keeping cows from sexual intercourse with bulls for a period of nine years produces creatures of incomparable beauty. These 'unbullied cattle' are so

³⁰ Translations that are not my own are from the Barnes (1995).

beautiful, they were kept in Epirus as the private property of the royal family (*HA* viii, 595b16–22).

Assuming that survival is the most basic good, we might expect that plants and animals reproduce only as much as necessary given its physical toll. But Aristotle's reports on domesticated animals suggest that plants and animals reproduce as long and as much as they are able. For example, he reports that the male and female sheep, goat, dog, horse, cow, boar, and sow breed more or less their entire lives (*HA* vi, 573b29–30, 574b27–8, 576b20–3, 575a30); that domesticated animals breed all seasons thanks to good food and shelter (*HA* v 542a26–8, vi 575b31–3); and that in Egypt, where food is bountiful (*HA* vii, 606a25–6), hens lay eggs longer through the year (*HA* vi, 562b24–5). He states that the same occurs with plants, fish (*HA* v 11, 543b23–31), and women. Where food is bountiful, women are more fruitful (*HA* vii, 584b6–8), and more apt to give birth to twins (*HA* vii, 584b29–30).

At the end of *DA* ii 4, Aristotle tells us that nutrition is the capacity to use food for the preservation of the individual organism—the *embodied* organism (416b9–19)—and that what is fed is the ensouled body (416b9–10, 22). He also there tells us that the capacity to preserve oneself through the acquisition and use of food is not the capacity to generate oneself: “for the substance of the individual exists already and nothing generates itself, but only preserves itself” (416b16–17). The end of reproduction is to bring into existence something like the parents in kind but not the parents, by funneling vital nutriment *away from the parents' bodies* for the sake of the offspring. Evidently, Aristotle defines reproduction differently from nutrition. But does this indicate that he thinks the functions have different ends?

So far, Aristotle's reports on, and theory of, reproduction in the biological works are not devastating for those who attribute the RI thesis to Aristotle. At this point, it can still be argued that the two functions afford organisms the same good, survival, which differs only in degree. For as long as reproduction offers organisms a greater degree of survival than nutrition, the detrimental features of reproduction do not contradict the RI thesis. Nonetheless, the possibility of a new interpretation emerges from the biological works: that reproduction has a different end from nutrition. In the next section, I continue to build the case for an alternative reading. I point to evidence suggesting Aristotle believes reproducing affords organisms a unique good: a good distinct from and more essential to plant and animal flourishing than self-maintenance and continued existence. I propose that Aristotle believes self-maintenance and continued existence are for the sake of reproduction.

The Most Natural of Functions

We recall that in our *De Anima* passage, Aristotle maintains that reproduction is the most natural of functions. What is not clear is whether he means that just reproduction is the most natural of functions or whether he means to include nutrition as well. He writes:

For the nutritive soul is found with all the others, and is the first and most common faculty of the soul in virtue of which living belongs to all things. Its functions are reproduction and the use of food; for the most natural of functions in living beings (φυσικώτατον γὰρ τῶν ἔργων τοῖς ζῶσιν), whatsoever has achieved maturity and is not deformed or spontaneously generated, is to produce another such as itself, animal producing an animal, plant producing a plant, in order that it may partake in the eternal and divine insofar as it is able. For all things strive for it, and it is that for the sake of which they do whatsoever they do according to nature (for the sake of which is double, there is that for which and that to which). (415a23–b3)

Notice that here Aristotle applies the description “the most natural of functions” only to reproduction. But it is reasonable to assume that Aristotle means for this designation to apply to nutrition as well, and that nutrition and reproduction have fundamentally the same end. In that case, the ambiguous “it” in the final sentence of the passage quoted above would refer to “survival” or “continual existence.” The sentence would read: survival is that for which “all things strive” and “that for the sake of which plants and animals do whatsoever they do according to nature.” Alternatively, if Aristotle means that reproduction (and reproduction alone) is the most natural of functions, then Aristotle here establishes that reproduction has a different end from, and is more fundamental to life than, nutrition, despite the fact that some plants and animals lack this capacity altogether. The final sentence would imply that plants and animals seek nutrition for the sake of reproduction.

Admittedly, the alternative reading of this passage is unintuitive: it implies that the capacity to reproduce is more natural than the capacity to use food for the sake of self-preservation, even though it is less prevalent among living creatures. Yet there are other indicators to suggest that, in Aristotle’s view, the possession of a nutritive capacity is not fundamentally what makes plants and animals alive. One reason to doubt that the capacity to preserve oneself is the capacity that characterizes life most basic is the privilege that Aristotle reports nature to afford reproduction. In the last section, we saw that Aristotle believes reproduction diverts vital nutriment from the parents to the offspring at the expense of their physical health, longevity, and food source. But despite these consequences, his reports indicate that plants and animals reproduce as much

and as long as they are able. This privilege that Aristotle views nature as affording reproduction can be interpreted to mean that Aristotle regards reproduction as more essential to plant and animal flourishing than nutrition and self-preservation.

A second reason to doubt the fundamentality of survival is that Aristotle consistently fails to mention the acquisition and use of food when specifying the *shared* function of plants and animals. (Animals also have the function of sense-perception.) Consider the following passage in the *HA*, wherein Aristotle explains that the *scala naturae* is fluid, with no clear demarcation between the function of plants and animals:

Thus the function of plants that generate from seed appear to be nothing other than to produce offspring that are such as themselves but different (τῶν τε γὰρ φυτῶν ἔργον οὐδὲν ἄλλο φαίνεται πλὴν οἷον αὐτὸ ποιῆσαι πάλιν ἕτερον). Similarly for some animals there is no other function beyond generation to detect. (*HA* viii, 588b24–27)

Here Aristotle asserts that animals with little sensitivity do not appear to have a function beyond the one they share with plants: reproduction. It is significant that Aristotle restricts the comparison of animals to seed-bearing plants. He need not do so if his point is that survival is the end shared by plants and barely sensitive animals. This suggests that his omission of nutrition both here and in the *De Anima* is purposeful. Moreover, there are at least five other places in the *GA* wherein Aristotle reports that reproduction, but not also nutrition, is the shared function of organisms. In the course of explaining the differences in spermatogenic organs between males of different species, he writes:

The function (ἔργον) of most animals is more or less the same as the function of plants, which is <the production of> seed and fruit. (*GA* i 4, 717a21–22)

In his explanation for why some fish lay imperfect eggs that develop outside the uterus:

The cause is that they are fecund and that this is their function (ἔργον), just as it is of plants. (*GA* I 8, 718b8–9)

When comparing the life of an animal to that of a plant:

In all this nature acts like an intelligent workman. For to the essence of plants belongs no other function or business than the production of seed (τῆς μὲν γὰρ τῶν φυτῶν οὐσίας οὐθὲν ἐστὶν ἄλλο ἔργον οὐδὲ πρᾶξις οὐδεμία πλὴν ἢ τοῦ σπέρματος γένεσις); since, then, this is brought about by the union of male and female, nature has mixed these and set them together in plants, so that the sexes are not divided in them ... But the function (ἔργον) of the animal is not only to generate (which is common to all living things), but

they also participate in a kind of knowledge, some more and some less, and some very little indeed ... Now it is by sense–perception that an animal differs from those organisms which have only life (τῶν ζῶντων μόνον). But since, if it is a living animal, it must also live (ζῆν) therefore, when it is necessary for it to accomplish the function of that which has life (τὸ τοῦ ζῶντος ἔργον), it unites and copulates, becoming like a plant, as we said before. (731a24–b8 trans. by A. Platt)

When considering whether the parts of the offspring are present in the semen:

But it is necessary that semen is generated first, and that is the function (ἔργον) of the progenitor. (734b1–2)

And when explaining the manner by which an organism develops:

It is necessary that the heart, which has the principle of increase, comes into being first. For whether plant or animal, the nutritive capacity belongs to all alike. It is the capacity to produce what is like oneself but other. For this is the function (ἔργον) of all, both plant and animal, who are perfect in their nature (φύσει τελείου). (735a15–19)

Nowhere does Aristotle include the acquisition and use of food as a shared function of the organism. He does report that the doings (πράξεις) of animals concentrate on two tasks: the procurement of food and procreation (589a2–4; 596b20–21). But this appears to be a different claim, especially when we note that the remark at 589a2–4 comes on the heels of his assertion that the function of plants and plant–like animals is none other than to reproduce its kind (ἔργον ἄλλο οὐδὲν φαίνεται πλὴν οἷον αὐτὸ ποιῆσαι πάλιν ἕτερον). Aristotle uses the word πράξις to describe a variety of different processes including growing, having sex, waking, sleeping, and moving (645b33–35). In contrast, he uses the word ἔργον to specify the function, or essential nature, of an organism or its parts.³¹ Thus, at the end of *De Anima* ii 4—after he has defined nutrition as the capacity to preserve the embodied individual (τόδε τι) and reproduction as the capacity to generate offspring that is such as the progenitor but different—Aristotle says:

Since it is right to call all things by their end, it would be right to call the first soul the reproductive soul, as its end is to generate what is such as itself but different. (416b23–25)

Aristotle implies that the capacity for nutrition is distinct from the capacity for reproduction, and that reproduction is more its function than nutrition.

A third reason to doubt the fundamentality of survival in Aristotle's teleological system is his hierarchical division of the animal kingdom in terms of the

³¹ See *NE* 1097b22–1098a18.

various modes of parturition (*GA* ii 1). At the top of the hierarchy stands the vivipara: those that “bring to perfection their young” (732a25–26) by generating “within themselves an animal of the same kind straightaway” and casting forth “complete offspring with respect to quality” (733b1–4). Next on the ladder are the internally oviparous but externally viviparous: animals such as sharks and rays that lay eggs within themselves, but give birth to live offspring of the same kind. Below these are the oviparous, a class admitting of division. Higher are the animals that produce eggs of perfect condition that do not develop outside the mother. This class includes birds, footless animals, and egg-laying quadrupeds like lizards and tortoises. Lower are those whose eggs must mature outside the mother. This class includes fishes, crustaceans, and cephalopods. Lowest on the scale of perfection is the class that belongs to insects generated by copulation for the reason that these produce grubs that complete two sets of changes before becoming an insect like its parents. Aristotle lists locusts, cicadae, spiders, wasps, and ants among the insects that develop first into an egg-like entity before developing into an insect of the same kind as its progenitor (721a4–6, 732b11–14). Intriguingly, Aristotle does not include the spontaneously generated in his hierarchy of animals at 733a32–b16. The spontaneously generated include testacea such as mussels, trumpet-shells and purple-fish—these three provide reproductive material for the generation of creatures like themselves in kind. They also include insects like fleas, flies, and cantharides, which copulate and generate grubs, as well as insects like gnats and mosquitoes, which do neither (721a5–10).

Because Aristotle correlates heat and moisture to an animal’s mobility, sensitivity, and intelligence—attributes that would seem to be associated first and foremost with animal perfection—it would be reasonable to assume that Aristotle believes an animal’s mode of parturition is nothing more than an accidental feature of its capacity for heat and moisture. Yet Aristotle assures us that the division of the animal kingdom is good and orderly (733a33), and that the *function* (ἔργον) of the naturally perfect (φύσει τελείου) is to generate animals of the same kind (735a17–18). Aristotle asserts in the *Metaphysics* that the naturally perfect are those species whose natures are not deficient relative to the excellent and good with respect to its genus (1021b15), and says in the *Nicomachean Ethics* that “the good and the well seem to lie in the function” (1097b26–27). That the vivipara are perfect in their nature (732b28, 737b15–16) tells us that the function and good of animal life is to “bring to perfection their young” by casting forth live animals of the same kind as themselves. The implication is that species whose nature falls short of this end are imperfect relative to the genus of animals; and species whose members are spontaneously

generated are not animals in the full sense of term, but so-called by virtue of the similarities they share with full-fledged members of the genus.

One might object that Aristotle regards the spontaneously generated as noble, some more so and some less (762a24–26). The thinking might be: If the capacity to reproduce is not what makes the spontaneously generated noble, then it must be their capacity to keep themselves alive. So we might be tempted to see in this remark evidence that Aristotle took survival to be the good that benefits living organisms and drives the reproductive enterprise. But there is another way to understand the nobility of the spontaneously generated. The context in which Aristotle asserts that the spontaneously generated are noble, more so or less, is the formation of testacea. All testacea, we learn, are spontaneously generated (763a25–26). But muscles, trumpet shells, and the purple-fish have an excess of nutritious material, which resembles a honeycomb when emitted. This residue is not spermatic. It lacks the power to engender a creature of the same kind as that from which it came. But the honeycomb can provide the matter out of which an organism like the original comes to be. And that, says Aristotle, explains why testacea are readily formed alongside others and are quite plentiful. Therefore, I suggest that the spontaneously generated are more or less noble depending on their ability to share in generative processes: some like gnats and mosquitos share not at all; others like trumpet shells and purple-fish can provide the material out of which an organism like itself is formed; others like flies and fleas copulate and even generate a living being, namely a grub.

In the next section, I will explain why Aristotle thinks the vivipara are the measure of animal perfection. But I conclude this section by considering what follows if Aristotle affords reproduction a privileged place in his teleology as the shared function of plants and animals. There are two points to make. First, it follows that individual plant and animal flourishing will be proportionate to the creature's ability to produce viable offspring, and not measurable by markers like strength, weight, beauty, and size. This means that an organism could flourish even when wasting away, as long as its vital energy is spent on the production and care of its offspring. Conversely, an organism could be healthy and long-lived, like "the unbullied" cows of Epirus, but fail to thrive because it is kept from pursuing its most natural ends. Second, it follows that health and continued existence will not be primary goods, but goods in service to reproduction. Hence, in the proposed interpretation, plants and animals live to reproduce, and seek food and nutrition for that end. They do not, I maintain, live in order to survive.³²

³² Cf. Johnson (2005, 178).

The End of Reproduction: the RI Revisited

In the preceding two sections, I argued that Aristotle does not take nutrition and reproduction to share the same ends on the grounds that he (i) believes plants and animals reproduce at the expense of their nutritional needs, (ii) identifies reproduction, and not also nutrition, as the shared function of plants and animals, and (iii) takes animal perfection to be realized in the capacity to generate straightaway live animals of the same kind. But again we reach an impasse, for each of these claims can be made consistent with the RI thesis: (i) and (ii) on the assumption that the good of reproduction is of the same kind but *much greater and more divine* than that of nutrition; and (iii) on the hypothesis that the modes of parturition reflect the species' ability to meet its end of eternal survival. Stavrianeas recently made a case for understanding Aristotle's *scala naturae* in this way, arguing "kinds that leave imperfect offspring are more sensitive to deformities and failures ... so, kinds that leave imperfect offspring score lower in terms of reproduction or survival rates of their young."³³ On the assumption that "animals participate in the divine ... by means of successful reproduction," he concludes that "kinds whose specimens run a greater risk of being unsuccessful in reproducing something like themselves, can be viewed as being in a worse situation with respect to participation in the divine."³⁴ Stavrianeas points to Aristotle's claim in *De Anima* ii 4 that animals partake in the divine some more, some less (415b6) in defense of his interpretation.

To advance the proposed interpretation, I must do more than present an alternative reading of the biological texts. I must also challenge the tenability of the RI thesis itself. I propose to do so first by challenging the hypothesis that attenuated immortality via the persistence of one's species-specific form is a good worth the sacrifice of an organism's health and longevity.³⁵

We recall that on the organism-centered interpretation, the ends of an organism can be derived neither from god nor from some abstract standard of the good. The ends of the organism (i. e. its soul functions) exist for the sake of the organism, by promoting its survival and well-being. In this view, the good of immortality can be explained straightforwardly as a simple extension of actual living. However,

³³ Stavrianeas (2018).

³⁴ *Ibid.*

³⁵ To be clear, Johnson *et al.* have not argued that attenuated immortality makes reproduction worth its physical harms because, generally, they have not considered Aristotle's reports on the physical toll of reproducing. But if the account given of reproduction's harm is convincing, then I can see no other way to salvage the thesis except by arguing that attenuated immortality is a good greater than longevity.

according to the organism-centered interpretation, what organisms stand to gain by reproducing is not immortality but a tenuous form of eternal existing: a form whereby the individual does not actually live at all. Therefore, because *actual living* is the measure of what is good, and because reproducing is physically demanding, increases competition for food, involves self-sacrifice, and *curtails actual living*, the challenge for advocates of this interpretation is to explain why the preservation of one's species-specific form through one's own act of reproduction is more desirable than not reproducing and living a significantly longer, less stressful life. Admittedly, this argument puts the burden of proof on a long-established position. But the RI thesis has not confronted the evidence that Aristotle regards reproduction as physically harmful.

Nonetheless, we should not assume that the problem with the RI thesis lies only with the weakness of the immortality sought. It does not matter whether the outcome is attenuated or actual immortality. The thesis has a deeper problem: a problem that persists whether it is deployed in an organism-centered or a cosmic interpretation of Aristotle's teleology. In short, the RI thesis would not have been tenable for Aristotle because it divests life of meaningful activities by locating the good of reproducing in an outcome that is separate from and better than the actions involved in reproducing.

Aristotle distinguishes between types of ends in the opening chapter of the *Nicomachean Ethics*. There we are told that the end can be found in the activity itself or in an outcome that stands apart from the activities that produce it. Furthermore, he states that when the end is an outcome separate from the activities, the outcome is better than the activities themselves. Immortality would be an end separate from the activities involved in reproducing because it is neither constituted by nor manifest in mating, rearing, or the like.³⁶ (Successful reproduction is no guarantee of eternal survival through one's descendants since much more has to happen in order for that to be the case.) And from this it follows that the actions necessary for the attainment of immortality only have instrumental value for the progenitors. Mating, brooding, and rearing are good only insofar as they are necessary for the eternal persistence of one's form.

Why is this problematic? Consider what follows on the assumptions that (a) immortality is the outcome that drives the reproductive enterprise, (b) nutrition and reproduction share the same end of survival, and (c) the lives of plants and animals concentrate on acquiring nutriments and reproducing (589a2–5). An organism would labor throughout its life to acquire nutriments and reproduce in

³⁶ Cf. 1050a28–29, where Aristotle explains that the activity of building is realized in the house. Arguably, the activity of house-building is not separable from the end of house.

order for it to survive; similarly, its offspring would labor throughout their lives to acquire nutriments and reproduce for them to survive; and their offspring would labor throughout their lives ... and so on and so forth. Plants and animals would seek food and reproduce to live, but would spend their waking lives mostly seeking food and reproducing. Johnson sees no problem with this scenario: “the organism,” he reports, “lives for the sake of its survival.”³⁷ But arguably nothing in this picture is able to justify Aristotle’s claim that “living is better than not living” (*GA* ii, 731b30)³⁸: a claim Johnson mentions repeatedly in support of his interpretation that survival is the most basic of Aristotelian goods. This is because the RI thesis effectively separates living from the activities and doings that constitute an organism’s waking life.

An alternative is to suppose it is Aristotle’s view that plants and animals reproduce because the reproductive activities—coupling, mating, gestating, birthing, nursing, brooding, and rearing—are good for the progenitors *and that they are good for the progenitors because to live is to reproduce*. Indeed, I believe this is the meaning of Aristotle’s assertion that animals reproduce because they “must also live” (731b5), and that plants’ capacity to reproduce is the reason they “also partake of life” (732a12). Aristotle, I submit, does not believe that plants and animals reproduce to extend their lives. He believes they reproduce because such is the most basic manifestation of life.

Aristotle’s discussion of benefaction in the *Nicomachean* and *Eudemian Ethics* provides strong support for the interpretation advanced here. The question driving the discussion is why benefactors are fonder of their beneficiaries than the beneficiaries are of their benefactors. Aristotle’s answer is relevant to our discussion because it applies to producers of all sorts, including human and non-human organisms. He explains the puzzle as follows:

Benefactors love and treat with affection the beneficiaries even when they are not useful and will not become so. The very same affections are present in craftsmen too. For every craftsman loves her work more than she would be loved by the work, were it to come alive. This is perhaps especially so with poets. For they are inordinately fond of their own poetry, loving them as if their children. The case of the benefactor is similar to this. For the beneficiary is their work. And they love this work of theirs more than the work loves its producer. (1167b31–1168a5)

³⁷ Johnson (2005, 178).

³⁸ Johnson (2005, 176) recognizes that there would no point to immortality were the value of life not grounded in some good of living. He writes: “There would be no point to infinite reproduction and permanent existence unless we could point to some good which this eternal and infinite process aims at. That good, I contend, is the life, survival, activity, and flourishing of the individual living specimen.” Yet I cannot see how he avoids making life and desire empty of value.

The paradox is that the work receives the greatest gift of all—the gift of support and, in the case of children, the gift of existence (1161a16)—and yet the parents and benefactors, who labor and sacrifice on behalf of their work, love their children and beneficiaries more than they are loved by them (1161b21–22). Mothers exemplify this paradox well. According to Aristotle, mothers love their children more than fathers, even though they bring their children into the world with great pain (1168a24–26). Aristotle rules out the possibility that the work is loved for its utility. Therefore, the work seems to have greater reason to love the producer than the producer has to love her work. Aristotle resolves the paradox by arguing that producers love their work because their work manifests their being:

The reason is that being is for everyone choice-worthy and lovable. And we are by our actuality, i. e. by living and doing. But the maker in actuality is the work in some way. Hence the producer loves the work because she loves her being too. This is natural. For what she is in potentiality, the work reveals in actuality. (1168a5–9)³⁹

The argument runs on the assumption that the producer's labor is actualized in her work: a position Aristotle articulates in *Metaphysics* ix 8. "The act of building," he explains, "is in the thing built. It comes to be simultaneously with the house and exists in the house" (1050a28–29). So, because the actuality of the producer is realized in her work, and because we are by virtue of our actuality, the work manifests the being of the producer. The paradox is resolved. The producer's love for her work is an expression of self-love: a claim Aristotle repeats in the *Rhetoric*. "Since we all love ourselves, it is also necessary that what belongs to us, namely our work and words, is pleasant to us. That is why ... we love our children. For our children are our work" (1371b21–25). Therefore, we can reasonably conclude that the good for the benefactor, the craftsman, and the parent is doing and producing.

The implications of the supposition that we are by doing and producing are far-reaching and reveal the limitations of the RI thesis to explain features of Aristotle's biological and ethical worldview. To illustrate, the supposition explains Aristotle's insistence that the division of the animal kingdom by modes parturition is hierarchical. For it is on this supposition that Aristotle can insist the generic nature of animals is to produce offspring of the same kind and, thereby, animal perfection is exhibited in a species' ability to cast forth animals that are perfectly defined. In fact, there is little evidence to support Stavrianeas' theory that the hierarchy is a function of the survival rate of a species' offspring. Even if it were true that Aristotle believes imperfect offspring have lower survival rates than perfect offspring, we would not be entitled to

³⁹ Cf. *EE* 1241a35–b9.

conclude that imperfect progenitors have a lower chance of survival via their offspring than their perfect counterparts. Animals imperfect in their nature cast forth copious eggs. Moreover, Aristotle believes the species are eternal.

The supposition that we are by what we do and produce also explains why it is pleasant to labor for the sake of others, and how it is that perilous labor—even self-sacrifice—can be good for the producer. We are told that labor is pleasant because being active and doing is pleasant (1168a13). And it is good even when hard because labor conditions love:

[T]he reason is partly the general natural principle—activity is more desirable ... Hence in animals their strong feeling for their children both in begetting them and in preserving them afterwards. And so fathers love their children—and still more mothers—more than they are loved by them ... because nothing is so good as activity; in fact, mothers love more than fathers because they think the children to be more their own creation; for the amount of work is measured by the difficulty, and the mother suffers more in birth. (*EE* vii 8, 1241a39–b9 trans. J. Solomon)⁴⁰

The argument that doing is better than receiving is premised on the observation that our love deepens when we labor for the object of our affection. The premise is evinced on the observations that caring for others is more fulfilling than being loved, and that “mothers are fonder of their children than fathers.” Aristotle explains that mothers are fonder of their children because they recognize their children as theirs more readily than do fathers. The reason is that giving birth involves suffering. Nothing is said here about the passing on of one’s form or eternal existence. Instead, productive labor is celebrated for the love it engenders. Love thereby serves as a testament to the value of reproducing itself—even for animals.

By contrast, the RI thesis does a poor job of making space in the good life for hard labor and self-sacrifice. If we love what is good, then on the RI thesis, love is but an expression of our desire to be immortalized by our offspring. It follows that the labors of reproduction offer parents no unique, irreplaceable set of goods. It would matter to the parents not *how* the offspring survives, only *that* it does. The cuckoo would not be ‘cowardly,’ as Aristotle says, for disposing her eggs in another bird’s nest. She would not be shying away from the good out of fear, thus she might even be considered clever.⁴¹ In general, parents would stand to gain from outsourcing the labors of bearing and raising children, as Plato’s Socrates proposes for the guardians of his ideal city–state (460c). I would add that the value Aristotle places on the hard work of raising children speaks well of him as a parent.

⁴⁰ See also *NE* ix, 1168a19–26.

⁴¹ *HA* ix 29.

Participating in the Divine

It remains for us to say how plants and animals partake in the eternal and divine by reproducing (415a29–b1), if not by attenuated immortality. For having rejected the RI thesis, we have no recourse to the familiar and easy way it explains plants' and animals' relationship to "the eternal and divine." However, it would be a mistake to reduce Aristotle's assertion that plants and animals reproduce for the sake of the eternal and divine as rhetorical flourish. We saw earlier that Aristotle presents this theory as explanation for why reproduction is the most natural of plant and animal functions. In turn, this claim that reproduction is the most natural of plant and animal functions provides the justification for situating reproduction within the most basic and common type of soul. Thus, "the eternal and divine" appears to play an important explanatory role in Aristotle's biology. Our task, then, is to identify to what "the eternal and divine" refers and explain its relationship to the reproductive soul function. Specifically, we seek to understand the role that the eternal and divine plays as cause of both the reproductive soul function and its status as most natural of plant and animal functions.

In this final section, I present an interpretation of "the eternal and divine" that has the virtue of pulling together the pieces of the story sketched out in the preceding sections. A thorough defense of my position will have to wait for another time. In short, I argue that "the eternal and divine" of *DA* ii 4 refers to continuous generative activity, which Aristotle identifies as the being of the sublunary realm. I show that continuous generation has features not shared with the reproductive activities of individual organisms. Continuous generation is one, eternal, and necessary, but its parts are infinitely many, finite, and potential. This implies that continuous generation is ontologically prior to reproducing organisms and stands to the reproductive soul function as an end to its parts. I maintain that the move to posit reproduction's end in an external good does not diminish the significance and value of the individual organism's life. I contend that by identifying continuous generative activity with the being of the sublunary realm, Aristotle treats reproduction as an activity akin to that of the divine. I turn now to *GC* ii 10, first to contextualize the passage of our interest and then draw some conclusions.

GC ii 10 concerns the efficient and final causes of continuous generation and corruption. After demonstrating that its efficient cause is the oblique rotation of the sun around the earth, Aristotle turns his attention to its final cause, establishing first that it has one:

Generation and corruption will always be continuous (συνεχῆς ἔσται ἢ γένεσις καὶ ἡ φθορά), and will never fail owing to the cause we stated. And this continuity happens for a good reason (εὐλόγως συμβέβηκεν). For we say that the nature in all things strives for the better always, and being (τὸ εἶναι) is better than not being. (336b25–29)

That continuous generation and corruption has a final cause is deduced from the assumption that nature does nothing in vain. If it is better that generation and corruption are continuous—if it is better that the cosmos does not manifest the two states intermittently as Empedocles thought—then its continuity will happen for a good reason (εὐλόγως συμβέβηκεν): it will have a final cause. Aristotle concludes that continuous generation has a final cause, being, on the grounds that “being is better than not being.” And in the lines that follow, Aristotle describes the connection between continuous generation and being.

But as not all things can possess being because they are too far removed from the source, god filled up the whole universe in the manner left open: by making generation continuous so that being (τὸ εἶναι) would be strung together as much as possible. This is because the nearest thing to being is generation that is eternally being generated (διὰ τὸ ἐγγύτατα εἶναι τῆς οὐσίας τὸ γίνεσθαι ἀεὶ καὶ τὴν γένεσιν). The cause of this, as has been often said, is circular motion; for circular motion is alone continuous. (336b30–337a1)

We can put aside Aristotle’s claim that “god filled up the whole universe ... by making generation continuous”. Although god’s role here is relevant to this paper, our present concern is to uncover the referent of τὸ εἶναι: the good end that is secured by continuous generation and, thereby, the reason god is said to “fill up” the universe. To understand how god serves as cause of continuous generation, it is necessary to understand first how being serves as its end.

There are three main contenders for the referent of τὸ εἶναι. One possibility is that being refers to the eternal existence that individual organisms obtain via the persistence of its species-specific form. This is Johnson’s reading of the passage. Having argued that organisms cannot be for the sake of some higher, external good, Johnson maintains that this passage concerns the good that individual organisms obtain by reproducing. Accordingly, he takes the maxim “being is better than not being” to articulate the axiological grounds for the claim that reproducing has its end in eternal existence. Animals and plants reproduce because such is their way of obtaining being.⁴² Notice, however, that

⁴² Johnson points to a similar argument at *GA* ii 1, 731b17–732a7 as further evidence of his claim that ‘being is better than not being’ grounds the value of reproduction for organisms. The *GA* argument is part of a larger argument answering the question of why there is sex differentiation. Before Aristotle can argue that it is better that the males of a species are separated from the females of a species, he must first prove the more general claim that it is better that plants and animals reproduce. If there is no good reason for plant and animal reproduction,

in the *GC* passage, being is the end—the good—of *continuous* generation and corruption. Thus, as no individual organism can generate and corrupt continuously, on Johnson’s interpretation of the passage, no individual could obtain being by reproducing—not even the diluted being of attenuated immortality. So it would seem that Aristotle presents the maxim “being is better than not being” to ground an assumption about the sublunary realm.

Other scholars have also argued that our *GC* ii 10 passage takes a “bird’s eye view,” in that it considers reproduction from the perspective of the cosmos taken as a whole. Read in this way, being can refer either to an endless string of organisms that result from reproductive activity or it can refer to endless generative activity itself. Devin Henry takes the former view, suggesting that the being “guaranteed” by continuous generation is manifest in “eternal lineages”: “a continuous (gap-less) chain” of individuals, which ensures that “there will always be some sublunary beings in existence.”⁴³ He takes his cue from lines 336b30–33:

But as not all things can possess being because they are too far removed from the source, god filled up the whole universe in the manner left open: by making generation continuous so that being (τὸ εἶναι) would be strung together as much as possible.

These lines reference *things* that possess being, so Henry takes the argument to concern primarily the occupants of the cosmos. Henry explains that, for Aristotle, the ideal universe would contain only eternal substances. But because the actual universe contains corruptible entities, the best scenario is a universe containing no “existential gaps.”⁴⁴ Therefore, Henry maintains that sublunary being is manifest in the “gap-less chain” of occupants, not in continuous

than there can be no good reason for the differentiation of the sexes. In the *GA* passage, we are told that animals reproduce because souls are better than bodies, the ensouled are better than the lifeless, being is better than not being, and living is better than not living. Since these things are better, and since animals cannot be immortal, animals reproduce. For our purposes, what is important is that the maxim “being is better than not being” is introduced alongside three others to explain why there is animal generation. Johnson ignores all but the first two maxims. But if Aristotle presents the maxim to ground the theory that plants and animals reproduce for the sake of their own being or immortality, then so too should the maxims that the soul is better than the body and the ensouled better than the lifeless. That reproducing does not enable individual plants and animals to obtain soul and become ensouled suggests that, like the *GC* argument, the *GA* argument concerns not the good that individual organisms obtain by reproducing, but the good the cosmos obtains by containing reproducing organisms. The idea is: It is better that the cosmos contains organisms that perish but reproduce than not because souls and ensouled beings are good.

⁴³ Henry (2015, 106 and 109).

⁴⁴ Henry, *ibid.*

generation. Diana Quarantotto assumes the latter reading, focusing on the next line, wherein Aristotle emphasizes generative activity: “the nearest thing to being is generation that is eternally being generated (τὸ ἐγγύτατα εἶναι τῆς οὐσίας τὸ γίνεσθαι ἀεὶ καὶ τὴν γένεσιν)” (336b33–34).⁴⁵ Aristotle appears here to identify being—or the nearest thing to being—with continuous generation because the activity of generation is such as to reproduce itself endlessly.

Quarantotto is interested in the *GC* passage because she believes it demonstrates Aristotle’s challenge to the then–orthodox position that being stands in opposition to change. Although I believe that she is right—outside of god, Aristotle’s being is dynamic—I argue for a position that she does not make: namely, that continuous generation is the activity and being of the sublunary realm, which Aristotle conceives as a natural organization that manifests a proper activity and functional parts *like* an organism. In my view, the key to the *GC* passage is the term “continuous.”

Aristotle tells us in the *Physics* that things are continuous when their parts share extremities and so are contained one in the other (227a11–13). Artifacts such as chairs and houses are not genuinely continuous because they are constituted of parts that have distinct boundaries: parts that must be joined together by glue, nails, or other riveting instruments and are, thereby, capable of being separated at some later point in time (227a23). The bodies of organisms are more continuous than artifacts because their parts cannot function in separation from the whole. The bodies of the heavenly spheres exhibit the most continuity because they thoroughly lack parts (278b17). Yet because the truly continuous lacks boundaries, the term most properly describes the infinite (200b16–19). Therefore, because the activities and movements of the divine are infinite in duration, the truly continuous are the eternal activities and movements that constitute the life and being of the divine. Indeed, Aristotle often appeals to the continuity of an activity or movement in demonstration of its goodness. Consider Aristotle’s description of god:

And life also belongs to God; for the actuality of thought is life, and God is that actuality; and God’s essential actuality is life most good and eternal. We say therefore that God is a living being. Eternal, most good, so that life and duration continuous and eternal belong to God; for this is God. (1072b36–30, trans. W.D. Ross)

So significant is the continuity of thinking that Aristotle argues in the *Nicomachean Ethics* that the contemplative life is for us the happiest life, and the life of reason our function, because we can contemplate more continuously than we can do any other activity (*NE* 1177a21–22; 1100b15–16; *cf.* 407a6–10).

⁴⁵ Quarantotto (2015).

And Aristotle routinely uses the term “continuous” to describe the activity of the heavenly spheres (222a10; 1016a4–6; 1071b10–11).

If in Aristotle’s view continuous activity and movement is indicative of the good, it is because the boundlessness of the continuous gives way to other features of the divine. Not only are continuous activities and movements unending, they are singular, cyclical (in the case of movements), complete at every moment, whole, eternal, and necessary. They are unending and singular because, with no definitive limits, they have no beginning, middle, or end. Successive movements have clear beginnings and ends, and so are multiple (259a17–20). Continuous movements are cyclical because only cyclical motion is unending. Aristotle denies the possibility of unending rectilinear motion (265a17–18). They are complete because every moment is at once a beginning, middle, and an end. And insofar as they are circular and complete, they are whole. They have a single form that unites them (1016b9–17). Their completeness also makes them eternal (259a16). A movement cannot become eternal through an endless process of becoming the movement it is (*Meta.* 1050b7–22). Eternality is not achievable; it requires completeness. Finally, because continuous activities and movements are eternal, they are also necessary (337b35). In Aristotle’s view, if something is always, it cannot fail to be.

Turning first to generation and corruption and then to generation alone, let us consider how they can be continuous. I argued earlier that generation and corruption are two sides of the same coin: on one side, reproducing is life–draining; on the other, it is life–investing.⁴⁶ Consequently, generation and corruption share a boundary and so are continuous one with the other. But in order for the cycle of generation and corruption to be continuous, generation must be continuous; hence, the shift in focus in the subsequent lines from continuous generation and corruption to continuous generation. Now generation also has shared boundaries. I argued that on the side of the parents, generation manifests as reproductive activity, but on the side of the offspring, it manifests as growth and development towards its mature state. And since the shared function of plants and animals is to reproduce their kind, reproduction manifests in the offspring as the development into a reproducing organism. Therefore, that reproduction is the shared function of plants and animals guarantees that the activity will eternally generate itself (τὸ γίνεσθαι ἀεὶ καὶ τὴν γένεσιν). It is also the reason that generation manifests completion at every stage of the undertaking. As Aristotle explains in *GC* ii 11, every generative act is

⁴⁶ That, I believe, is the internal efficient cause for why the processes of generation and corruption take the same amount of time (336b10, 18–19). We learn in this chapter the sun is the external efficient cause.

both a coming-to-be and a has-come-be (γίνεσθαι καὶ γεγονέναι, 338a15–17). The growth and development of the offspring towards its mature state marks the completion of the parents' maturity; hence, the coming-to-be of the offspring is the having-come-to-be of the parents. And this in turn means that generative activity in the sublunary realm is cyclical, one in form, eternal, and necessary.

This analysis of the continuity of generation give us grounds for concluding that, *pace* Henry, the end and being of continuous generation is the activity itself and not “eternal lineages”: gap-less chains of individuals. Activities and movements are continuous and thereby divine; “eternal lineages” are not. They may be endless, but lineages are constituted of organisms that come to be successively: organisms that have definitive boundaries. Therefore, lineages themselves are not complete, whole, eternal, or necessary. We all belong to lineages that, according to Aristotle, extend infinitely into the past and future. But since it will always be the case that most of our ancestors are dead and most of our predecessors are yet to be born, our lineages will at no time be complete and whole. They will remain always potential and therefore are neither actually eternal nor necessary. Hence, given that being is the end and good of continuous generation, and given that being most proper is possessed by the eternal and divine, we have reasons for rejecting Henry's interpretation.

But what is at stake? Why does it matter whether Aristotle identifies being with continuous activity or with a gap-less chain of individuals? There are three implications of the proposed interpretation worth emphasizing. First, if Aristotle identifies being with continuous generative activity, then *GC* ii 10 affirms the intrinsic goodness of reproduction. Because continuous generation manifests the attributes of divine or divine-like being, it follows that individual reproductive undertakings manifest certain divine or divine-like attributes. Every successful reproductive act returns on itself by creating itself; thus every successful reproductive act manifests circularity, completeness, and unity. By contrast, the function of nutrition lacks the qualities associated with divine or divine-like activities and movements. This function has definitive ends (i.e. when the individual dies). Moreover, the act of acquiring and using food for self-maintenance and continued existence does not produce other nutritive soul functions. Hence within this framework, *GC* ii 10 helps us see why Aristotle would treat reproduction as the most basic manifestation of life and not (or not also) nutrition.

Second, the proposed interpretation gives generative activity a special place in a cosmic hierarchy of life and being. At the top of the hierarchy stands god's life and activity because it is life and being most continuous. Lacking all internal limits (there exists no differentiation of, or movement between, its thoughts), god's activity is wholly unified, complete, eternal, and necessary. Next in the

order of eternal life and being comes the continuous rotation of the heavenly spheres. Their movements are less continuous than the activity of god, because their movements admit of differentiation. The spheres are positioned in one way at one moment, and in another way at another moment. Thus they admit of potentiality in place and are not in their movements thoroughly complete and unified. Below the spheres stands sublunary being. It is lower on the hierarchy of being because its movement involves infinitely many reproducing organisms. Therefore, it manifests continuity, oneness, wholeness, and circularity to a much lesser degree. That is why Aristotle insists that “generation that is eternally being generated is the *nearest thing* to being.” Continuous generation is *like* the being of the spheres and god, but it is not, properly speaking, being for the reason that it is not the essential nature of a singular, living entity.

Third, the proposed interpretation nonetheless implies that Aristotle regards the sublunary realm as a naturally organized structure whose being (i. e. essential nature) is continuous generation and whose functional parts are reproducing organisms. This is because continuous generation is an activity, and therefore must be the activity *of* something.

To see why the proposed interpretation of *GC* ii 10 implies that the sublunary realm is a natural organization with an essential activity and functional parts, consider the alternative. The alternative is that continuous generative activity is an epiphenomenon: an emergent byproduct of reproducing organisms. This may sound plausible from our perspective, but from Aristotle’s it is simply not possible that continuous generative activity—activity that is one, whole, complete, eternal, and necessary—can be caused by the generating organisms alone. In the *Physics*, when arguing that god is the cause of continuous motion, Aristotle reasons that the many cannot of themselves give rise to one movement because many successive movements, being many, lack the principle requisite to unify themselves (*Ph.* viii 6, 259a13–20). Aristotle makes a similar case regarding continuous motion’s eternity and necessity (258b26–32, 1073a27–28). Whether or not Aristotle uses “continuous motion” in the *Physics* for “continuous generation”—Johansen thinks it does, and I would agree⁴⁷—the argument works just the same. The contributions of the reproducing organisms, even when taken together, lack the agency to explain features belonging to the whole. Individual reproductive undertakings past, present, and future cannot account for the eternity and necessity of continuous generation because each undertaking is finite and potential. (Aristotle explains at 338b9–11 that the existence of the begetter does not necessitate the existence of its offspring, even if the offspring implies the existence of its begetter. In his view, it is possible for any given reproductive act not to be.)

⁴⁷ Johansen (2015, 127).

Therefore, because the finite and possible cannot explain the eternal and necessary, continuous generation can only have its source in what is greater than itself: what is one and eternal. This is the reason that Aristotle names god the cause as end of continuous generation (336b31–32).

In Aristotle's teleology, the whole, the actual, the eternal and necessary are prior. They are prior in the sense that the existence of these substances implies the existence of their parts. Aristotle gives the example of a saw in *Physics* ii 8. If there is to be a saw, it must have the parts necessary for sawing: it must be made of hard metal and have a blade with teeth. In Aristotle's view, the saw's end determines its parts. But in this case, the parts are conditionally necessary relative to the whole. If the saw is to be, then it must have these parts; however, it is not necessary for the saw to be. By contrast, continuous generation is eternal and necessary. Therefore, its existence requires that its parts also exist of necessity. What parts can they be, if neither organisms nor their reproductive achievements are necessary? I argued earlier that reproduction's status as the most natural of soul functions accounts for the completeness and continuity of generative activity. Generation generates itself eternally because it generates organisms whose most basic function is to produce offspring of the same kind. Hence, if sublunary being must be, so too must the genus of living things whose most basic function is to reproduce its kind.

This brings us back to the questions with which we began the section: To what does "the eternal and divine" refer in *DA* ii 4, and what is the relationship between it and the reproductive soul function. I propose that "the eternal and divine" refers to continuous generation (at the very least), and that continuous generation is the being (i. e. the essential nature or form) of life in the sublunary realm. As the being of the sublunary realm, continuous generation is also the cause as end (οὐ ἔνεκά τινος) of the reproductive soul function and its status as the most natural of plant and animal functions. It is the organizing principle, *the life*, of a complex system that makes up the sublunary realm. Thus like any form and end, it necessitates the existence and orientation of its parts. Just as the soul is the form and end of the body's organs as the good that necessitates the organ's existence and orientation (415b15–21), so too, I maintain, is continuous generation the form and end of the sublunary realm that necessitates the existence and orientation of the reproductive soul function towards the divine. The case is parallel regarding the beneficiary of the goal directed activity (οὐ ἔνεκά τινι). Just as the beneficiaries of the body's organs are the individual that gains from having organs and the individual's soul, so too are the sublunary realm (plants and animals and the structures that support them) and its being (continuous generation) the beneficiaries of the existence and orientation of its

parts. This is because continuous generation requires the activities of its parts for its very existence and realization. Continuous generation may be eternal and necessary, but it is not its own cause. It therefore depends for its existence on higher and prior beings, and requires, *like* an organism, certain functional parts. As Aristotle says, “being is better than not being.” The sublunary realm benefits by the existence of organisms whose shared function is to reproduce its kind.

I end with this thought. Johnson worries that attributing a cosmic teleology to Aristotle would undermine the value he assigns to individual organisms.⁴⁸ But if the proposed interpretation is correct, then far from treating the individual as a mere instrument for the greater good, Aristotle’s cosmic teleology elevates each and every reproducing organism by connecting its most basic function to the divine. The picture I present softens Aristotle’s hierarchy of beings. Humans are not unique among sublunary inhabitants for their ability to access the divine through contemplation. Insofar as living is reproducing, life is divine, or at least divine-like. And I believe that demonstrates Aristotle’s deep and abiding respect for the inhabitants of this world.⁴⁹

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⁴⁸ Johnson (2005, 4).

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