ESSENCE AND END IN ARISTOTLE

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1. Introduction

Three [modes of cause] often converge upon one thing: the what-is-it and the for-the-sake-of-which are one, and the primary source of change is one in kind with these; for a man generates a man.[1] (*Phys*. 2. 7, 198^{a}24–7)

In a handful of passages, Aristotle claims that a thing's formal cause is often one with, or the same as, its final cause. I believe that this claim has led many commentators into confusion and wrong thinking about teleology, essences, and causation generally in Aristotle's thought. In this paper I hope to clear the way for a better understanding of these topics.

When Aristotle's sameness claim is understood in a straightforward way, it is open to obvious counter-example. An eye, for example, exists for the sake of seeing—that is its final cause—whereas its essence or formal cause is sight. Sight is a power, seeing is an activity. Sight can exist while no seeing exists. The two are not the same. As I will argue, the same goes for many other things in Aristotle's world, including plants and animals. They too have final causes which are not the same as their forms. Now, Aristotle's sameness claim admits many interpretations, since there is more than one way of being a final cause and there is more than one way of being the same. Perhaps there is some interpretation on which the claim comes out true. Certainly there are important truths for Aristotle which sound very similar to it. But I have not yet found a good explanation in the literature of how the sameness claim itself is true on Aristotle's overall theory.

Meanwhile, the sameness claim has had a great influence in the interpretation of Aristotle, and understandably so. Aristotle's teleology and his essentialism are among his most contentious and

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[1] Translations are my own unless otherwise noted.

also most enduring legacies. By bringing together these two aspects of his thought, the claim promises to illuminate both. Thus, for example, when scholars are puzzled as to how an end should be thought of as a cause, they often appeal for help to forms, or to some 'drive' or 'irreducible potential' for form (these things, at least, actually exist at the time of the explanandum).[2] Conversely, when they wonder in what way a form should be thought of as a cause, they often look for answers in the role of form as a goal of generation and development.[3]

What is more, the sameness claim promises a major simplification of Aristotle's doctrine of the four causes. It suggests that, in the natural world, the number of causal factors can be reduced from four to three, or even just two: matter and form. Suggestions for such a simplification are found already among the earliest and best extant commentaries on Aristotle, and continue to be put forward today.[4]

But despite these promises, the claim has done more to obscure than to help. If its upshot really is, as Ross puts it, that 'the final cause has been completely identified with the formal',[5] then it cannot represent Aristotle's considered view. Its uncritical acceptance by many commentators has led to error and confusion, not only about Aristotle's substantive beliefs, but about his very conceptual apparatus for thinking about causation.

After talking of confusion and error, I want to emphasize the con-

[2] Gotthelf proposes an influential definition of 'for the sake of' in terms of irreducible potentials for form in A. Gotthelf, 'Aristotle's Conception of Final Causality', in A. Gotthelf and J. Lennox (eds.), *Philosophical Issues in Aristotle's Biology* (Cambridge, 1987), 204–42 at 213 and 214 n. 19. Hankinson writes: 'Final causes, then, are parts of reality in the sense that the drive for form that they represent is written directly into the structure of things' (R. J. Hankinson, *Cause and Explanation in Ancient Greek Thought* [*Cause and Explanation*] (Oxford, 2001), 146).

[3] According to Bostock, in biological contexts Aristotle thinks that a form 'functions as a cause by way of being the goal towards which the animal develops' (D. Bostock, 'Aristotle on Teleology in Nature', in id., *Space, Time, Matter, and Form: Essays on Aristotle's* Physics [*Essays*] (Oxford, 2006), 48–78 at 61–2). For a similar thought see Hankinson, *Cause and Explanation*, 134–5.

[4] Alex. Aphr. *In Metaph*. 181. 19–22 Hayduck: 'someone will say that it is possible to reduce the principles to a pair of opposites, namely the active and the passive, if indeed matter is passive and the three causes apart from matter are reduced to the formal cause, which is active'. J. Lear, *Aristotle: The Desire to Understand* [*Aristotle*] (Cambridge, 1988), 27: '[Aristotle] believed that for the generation of natural organisms and for the production of artefacts there were at most two causes—form and matter.'

[5] W. D. Ross (ed. and comm.), *Aristotle's* Physics*: A Revised Text with Introduction and Commentary* [*Physics*] (Oxford, 1936), 526.

structive purpose of this essay. Most immediately, what I am doing is pointing out an apparent tension in Aristotle's writings, posing thereby an interpretative puzzle, and expressing dissatisfaction with how the puzzle has been handled up to now. But the larger aim is a positive one. The essay is motivated by the conviction that Aristotle's concepts of formal cause and of final cause possess great and enduring philosophical interest, and that a certain kind of work will help us recover a clearer understanding of them. The approach I have in mind is inspired by the ways in which philosophers today go about elucidating their own concepts, and in particular by two guiding ideas of much current practice. The first idea is that the elucidation of a concept need not consist in a definition or analysis of it. Instead, and above all when a concept is primitive, one can and should clarify it by laying out principles of its use, and by mapping its inferential connections with other salient concepts.[6] The second idea is that the best account of a concept is the one that best systematizes our use of the concept in making judgements about particular (actual or possible) cases. The *use* of the concept is, by and large, authoritative over *accounts* of the concept.[7] Thus, for example, when David Lewis developed his analysis of the concept of causation, he aimed to fit his analysis to our particular judgements about whether this event was or was not a cause of that event, in various described situations. When our judgements were seen to contradict his analysis, he revised his analysis rather than try to overrule our judgements.[8]

[6] For example, in a study of modal concepts, Stalnaker writes: 'One clarifies such notions, not by reducing them to something else, but by developing one's theories in terms of them' (R. Stalnaker, *Ways a World Might Be* (Oxford, 2003), 7). Gideon Rosen describes a related strategy in his discussion of metaphysical dependence: 'The plan is to begin to lay out the principles that govern this relation and its interaction with other important philosophical notions' (G. Rosen, 'Metaphysical Dependence: Grounding and Reduction', in B. Hale and A. Hoffmann (eds.), *Modality: Metaphysics, Logic, and Epistemology* (Oxford, 2010), 109–35 at 114). Rosen does not claim to be *elucidating* the concept in question, but only to be arguing that it is legitimate; still, I think he clearly contributes to the former project as well as the latter.

[7] Only by and large. Sometimes our judgements about a specific case are tentative, or divergent. Then the account that best deals with the clear cases can be allowed to settle the unclear case ('spoils to the victor'). Sometimes our pattern of specific judgements turns out to be incoherent or otherwise in need of revision, and an account of the concept can guide this revision. Again, sometimes a concept is introduced by stipulatory definition; in this case the definition presumably settles the standards of correct use.

[8] D. Lewis, 'Causation', in id., *Philosophical Papers*, vol. ii (Oxford, 1986), 159–213; id., 'Causation as Influence', *Journal of Philosophy*, 97 (2000), 182–97.

These two guiding ideas can, I think, be fruitful in our efforts to recover concepts that Aristotle employed and that are no longer current—in the present case, his concepts of formal and of final cause. It is likely that these concepts served for him as primitive ones, and that no acceptable definition of them is possible. But we can still elucidate them by setting out the patterns according to which he applied the concepts, and by identifying the sorts of inferences in which they figure in his thought. Aristotle's sameness claim is of double importance for such a project of elucidation. First, and most directly, it seems to identify an inferential connection between claims of formal causation and claims of final causation. It suggests, namely, that there is mutual entailment (given the presence of appropriate additional premisses) between the claim that B is a final cause of A and the claim that B is a formal cause of A. But second, it induces Aristotle's readers to make a whole range of interpretative moves whose effects ripple out. For example, some commentators seek to validate the sameness claim by means of the view that each organism exists for the sake of surviving and reproducing, thereby securing the continued existence of its species (see Section 4.1). This view about the ends of whole organisms places constraints on the ends that can be attributed to the organisms' parts and traits. The result is that Aristotle is supplied with a picture very similar to the outlook of today's evolutionary biology—a highly misleading outcome, in my view. Other commentators seek to validate the claim by conflating it with other, neighbouring truths, for example the truth that a thing's form is frequently a final cause of its generation, or of its parts, or of some of its activities (see Section 4.2). The net result of this is slippery and ambiguous talk: for example, when someone says that B is a final cause of A, it becomes unclear whether they mean that A exists for B's sake, or that A came into being for B's sake, or that (for some ϕ) A ϕs for B's sake, or something else.[9] Such a situation is fatal to the project of sorting out the logic governing Aristotle's concept of final cause.

[9] I have sometimes heard it said that a cause of X is anything that figures in an answer to a 'why' question about X. This account encourages the kind of ambiguity I am complaining about. For a slightly less extreme case, in print, see B. Hennig, 'The Four Causes', *Journal of Philosophy*, 106 (2009), 137–60 at 138 n. 3: 'Things and states have final causes insofar as they are, typically or as a matter of intention, involved in processes that have final causes.' (I typically walk to Husemannstraße for the sake of ice cream, but surely ice cream is a final cause of my walking only, not of me.)

It is therefore important to settle whether or not Aristotle's sameness claim accurately reflects his core understanding of formal and final causation. The second guiding idea suggests a method for addressing the question. We cannot, it is true, follow exactly the same methodology that David Lewis and others do. We have no body of 'folk' intuitions to work from; all of our data consist of theoretical statements made by Aristotle. Nevertheless, I think, we can distinguish between statements in Aristotle that are more and less authoritative for our purposes. Some statements figure in reasonably workaday explanations of concrete biological or other natural facts. Some statements derive from, or are used to derive, claims that are clearly central to Aristotle's thought, and are thus tightly bound into his web of beliefs. Such statements are weighty. Other statements are comparatively free-floating, or they are sweeping generalizations of the kind that philosophers often get wrong. These statements are less weighty. I have no overall system on offer for measuring the evidential weight of a statement. This paper follows the motto: first do it, then think about *how* to do it. It is an experiment in methodology, which will, I hope, lead to useful reflection on methodology.

2. Aristotle's sameness claim

The quotation with which I began, from *Physics* 2. 7, does not stand alone. It contains Aristotle's best-known identification of formal and final cause, but there are other places as well where he identifies or appears to identify them.

One such place is in the opening lines of *Generation of Animals*. Here Aristotle reviews the different kinds of cause in order to clarify the task of the treatise which he is introducing. He explains that some kinds of causes of organisms have been treated beforehand in his other biological works, but that one kind of cause (namely, the efficient) remains to be examined:

> We laid down four causes: the for-the-sake-of-which as an end and the account of the essence (*now these should pretty much be regarded as one*), then third and fourth the matter and the source of the beginning of motion. Now we have spoken of the others, for *the account and the for-the-sake-of-which as an end are the same*, and the matter for animals is their parts . . . but there remains to discuss the following. (*GA* 1. 1, 715^{a}4–11, emphasis added)

Important here is Aristotle's remark that 'the account of the essence', i.e. the formal cause, and 'the for-the-sake-of-which as an end', i.e. the final cause, 'should pretty much be regarded as one'; and, again, his statement that these two things 'are the same'.

A further passage to consider is found in *Metaphysics H* 4:

> When someone seeks the cause, since causes are spoken of in many ways, one must state all the possible causes. For example, of a man: what is the cause as matter? Is it the menses? What as mover? Is it the seed? What as form? The essence. What as for-the-sake-of-which? The end. *Perhaps these are both the same*. (*Metaph*. *H* 4, $1044^{a}32$–$^{b}1$, emphasis added)

Finally, there is the following argument, justifying an account of what a *polis* is, at the beginning of the (pseudo-Aristotelian) *Oeconomica*:

> Furthermore, households are joined together [into a *polis*] for the sake of this [namely, self-sufficiency with a view to living well]; and *that for the sake of which each thing is and has come to be is the substance of that thing*. (*Oec*. 1. 1, $1343^{a}12$–14, emphasis added)

In addition to these four passages, there are a few more in which Aristotle may be read as asserting the same identification, but need not be so read. The best-known of these is in *De anima* 2. 4. Here Aristotle explains that an organism's soul is a cause in three different ways: as a formal cause, as a final cause, and as an efficient cause:

> The soul is a cause and principle of the living body. These are said in many ways, and similarly the soul is a cause according to three of the modes which we distinguish: for the soul is a cause both as source of motion, and for the sake of which, and as the essence of ensouled bodies. (*DA* 2. 4, $415^{b}8$–12)

When Aristotle goes on to elaborate this claim in the following lines, it appears that he is thinking of the soul as a cause of three different things, not of one single thing, in these three different ways.[10] Nevertheless, the passage quoted certainly gives the impression that a soul is a formal, final, and efficient cause of one and the same thing, namely of an ensouled body (that is, an animal or plant).

Ambiguous statements, suggestive of the sameness claim, can also

[10] Aristotle's explanation at $415^{b}12$–28 suggests that the soul is a formal cause of the *animal*, a final cause (in a special sense—see sect. 4.3, esp. n. 61) of the animal's *body*, and an efficient cause *to* the animal of *locomotion*, *alteration*, and *growth*. (Being a cause of something *to* X is not the same as being a cause of X; see sect. 4.2, esp. nn. 44–5.)

be found in *Parts of Animals* (*PA* 1. 1, 641[a]27) and in *Generation and Corruption* (*GC* 2. 9, 335[b]5–7).

2.1. *Scope of the statements*

Before enquiring into the truth of Aristotle's sameness claim, we must take a moment to clarify how this claim should be understood. To begin with, the assertion from the *Physics* is qualified by an 'often'. So, just how often—in what range of cases—is the convergence of formal and final cause supposed to obtain? Traditionally, the range is taken to be very wide. W. D. Ross, for example, comments as follows:

> The qualification ['often'] is necessary, because the formal cause *ἐν τοῖς ἀκινήτοις* [among unchangeable things] is *not* an efficient or a final cause. But *ἐν τοῖς κινητοῖς* [among changeable things] the essence of a thing is identical with the end that is fulfilled in it; and the efficient cause of a thing is the essence of the thing present in another member of the same species.[11]

For Ross, then, Aristotle's thesis applies to every changeable thing. Other commentators are slightly less generous, but still pretty openhanded. Bostock, for example, holds that the thesis of *Physics* 2. 7 is intended to apply at a minimum to all living things, and probably to many artefacts as well.[12] The application to all living things, at any rate, is very plausible in the light of the passage from *Generation of Animals* quoted above, where Aristotle seems to speak quite generally about the causes of animals.

Next, what sort of convergence is Aristotle talking about? We must avoid reading his claim either too strongly or too weakly.

In the one direction, we should note that Aristotle is not saying that the *role* of formal cause is ever the same as the *role* of final cause. He is only saying that, often, the same thing has both of these roles in relation to something. For comparison, if I say that often a child's mother and its primary caregiver are one and the same, I do not mean that being someone's mother is the same as being someone's

[11] Ross, *Physics*, 526.

[12] 'While it is left somewhat vague quite how "often" this triple coincidence occurs, it presumably is intended to apply at least to all living things, which are Aristotle's primary examples of substances' (D. Bostock, 'Aristotle's Theory of Form', in id., *Essays*, 79–102 at 84). Bostock adds in a footnote (n. 15) that Aristotle would probably 'wish to identify the form and the purpose of many manufactured objects', including houses, ships, walls, and saws.

primary caregiver. I only mean that one person often occupies both roles.

In the other direction, we should note that Aristotle is not merely saying that the formal cause of one thing is often the final cause of some *other* thing. Rather, he should be understood as saying that the formal cause of a given thing is often the same as the final cause of that same thing. The first, and weaker, claim is without doubt true for Aristotle, but it would not naturally be expressed by saying, straight out, that the formal cause and the final cause are one or the same. For comparison, I believe that everything that is to the east of something is also to the west of something, and vice versa; yet I would not say, 'what is to the east and what is to the west are the same'. I also believe that, often, the father of one person is also the brother of another person; but this is not well expressed by saying, 'the father and the brother are often one'.

Finally, we must consider what is meant in these passages by 'one' and 'same', given that Aristotle famously distinguishes several different uses for each of these terms.[13] In our passages, Aristotle does not explicitly qualify or restrict his assertion of unity or sameness between formal and final cause.[14] This makes it natural to read him as asserting sameness and oneness in their strictest and most dominant sense, which we may express by saying that a thing's formal cause and its final cause are the same *per se* and in number.[15] To spell this out: let *A* stand for a term picking out some item under some description, and consider the best, most canonical way of filling in the blanks in the following two sentences: '____ is the formal cause of *A*'; '____ is the final cause of *A*'. Aristotle's sameness claim is naturally read as asserting that, in many cases, the very same term

[13] The loci classici for Aristotle's distinctions are *Top*. 1. 7 and *Metaph*. *Δ* 6 and 9.

[14] The sorts of qualification we might look for and do not find include 'in number (but not in being)', 'in kind (but not in number)', 'accidentally', or, most vaguely, 'in a way' (*πως*). It is true that Aristotle gives what might be taken as signs of hesitation or qualification, namely the word 'often' (*πολλάκις*) in *Phys*. 2. 7, 'pretty much' (*σχεδόν*) in *GA* 1. 1, and 'perhaps' (*ἴσως*) in *Metaph*. *H* 4. However, the first pertains only to the range of cases, not to the kind of sameness at issue; and the latter two words are frequently used by Aristotle to soften his tone without indicating any real limitation or uncertainty (cf. H. Bonitz, *Index Aristotelicus* (Berlin, 1870), $347^{b}32$ ff. and $739^{a}53$ ff.).

[15] Cf. *Top*. 7. 1, $151^{b}28$–30. My 'strictest and most dominant' corresponds to Aristotle's *κυριώτατον*. Aristotle omits the phrase '*per se*' (*καθ' αὑτό*) in his gloss of strict sameness in *Top*. 7. 1, but it is obviously intended: see *Top*. 1. 7, $103^{a}25$–6, and the fact that his tests for strict sameness would clearly be failed by true statements of accidental sameness such as 'the seated man is the same as the cultivated man'.

should fill both blanks. Or, at the very least, that the blank-fillers should be related as synonyms (like *himation* and *lōpion*, two words for a cloak) or as a word to the corresponding definition (like 'human' and 'biped land animal').

This reading is natural in the light of the use to which Aristotle puts his sameness claim. For he uses it in the introduction to *Generation of Animals* in order to justify the assertion that, having spoken of the formal causes of animals, he has thereby also spoken of their final causes. This works most easily if he is thinking that the questions 'what is its formal cause?' and 'what is its final cause?' should receive precisely the same answer, and not answers related as, say, 'the woodworker' and 'the mason' are related when Johnny is both woodworker and mason.

The natural reading may turn out not to be the right reading. But it is, I think, the usual reading (for example, Ross says that Aristotle has 'completely identified' the formal and final cause[16]), and a reasonable place to start. If we think that a different kind of sameness is in play, then we owe an explicit account of what kind of sameness this is. I do not know of any such account in the recent literature. (On the other hand, I have received some interesting suggestions in spoken discussion, and will report them later.)

3. Aristotle should have disavowed the sameness claim (in its strict form)

Now that we have clarified what Aristotle's sameness claim amounts to, let us consider whether it coheres with his wider body of views. I will argue for at least a qualified negative answer. On a strict reading of the sameness claim, Aristotle is committed to rejecting this claim over a wide swath of cases that are central to his concern.

Here is my argument in outline. There are many things, including animals, plants, and their functional parts, to which Aristotle ascribes a work (*ergon*), that is, some type of activity or product which the thing has the task of doing or making. Aristotle states, both as a general principle and in connection with various particular cases, that whatever has a work is there for the sake of its work. Hence, for a wide class of things, the work of each thing is a final cause of the thing.

[16] Ross, *Physics*, 526.

Now, scholars sometimes say that a thing's work is the same as its formal cause.[17] But even these same scholars seem, as if led by the truth itself, to contradict themselves, and rightly say that the two are different.[18] One way to establish the difference is by observing that a thing's work is something that need not actually be there in order for the thing to be there. For example, the work of my eyes is an activity, seeing, and my eyes are still there when no seeing is taking place, for example in the dark. Likewise, the work of an axe is chopping, or perhaps chopped wood, and the axe is still there while it hangs in the shed and no chopping or chopped wood is present. By contrast, it seems evident that a thing's formal cause is something that necessarily is there so long as the thing is there. Taken together, the last two points imply that it is possible for a thing's formal cause to be there while its work is not there, and this implies that the two are different. Since the work is a final cause, it follows that for a wide class of things, each thing has a final cause that is different from its formal cause.

In a moment I will offer a more formal version of the argument, and provide evidence that Aristotle is committed to all the relevant premisses. In preparation for that, I need to offer a few clarifications.

First, a note about the term 'work'. This corresponds to the Greek *ergon*, also commonly translated 'function'. It signifies an activity or product which a thing has the task of doing or making. I emphasize that a thing's work is an activity or product, not the *having it as one's task* to do or make this activity or product.[19] The latter property (perhaps 'job' or 'functional state' is an apt term for it?) will be

[17] 'The soul is the characteristic functions and activities that are essential to the organism' (T. Irwin, *Aristotle:* Nicomachean Ethics*, Translated, with Introduction, Notes, and Glossary*, 2nd edn. (Indianapolis, 1999), 348); 'a full identity between form and function . . . obtains in the case of fully realized forms' (M. Leunissen, *Explanation and Teleology in Aristotle's Science of Nature* [*Teleology*] (Cambridge, 2010), 87 n. 19).

[18] 'Aristotle therefore identifies substance and form with *first* actuality, the permanent state of the organism, as opposed to the intermittent vital activities' (T. Irwin, *Aristotle's First Principles* (Oxford, 1988), 236); 'Functions . . . exist "on top of" the realized forms that constitute the first type of final cause. For instance, a completed house is the final cause and the fully realized form of the art of house-building, while "shelter" is the function and final cause of the realized house' (Leunissen, *Teleology*, 13).

[19] This is especially clear at *EE* 2. 1, 1219^{a}13–17. Perhaps Irwin means 'functional state' when he says 'function', in which case I have been unfair to him in nn. 17 and 18 above.

there on an ongoing basis, whereas the work is sometimes there and sometimes not. For example, Sir Simon Rattle's conducting job is continually with him, whereas his work, conducting, occurs only intermittently.

Second, a remark about the attribution of works, final causes, and formal causes to things. We must bear in mind that the truth of all such attributions is highly sensitive to the descriptions under which each item is referred to. More accurately, this is the case when the attributions are understood as tacitly qualified by adverbial phrases such as '*per se*' or 'without qualification' (*kath' heauto*, *haplōs*), and the propositions in my argument should all be understood in this way. For example, suppose that one and the same person is both a doctor and a clown. Then we should say that the work of the doctor is health, and that the work of the clown is mirth. We should *not* say that the work of the doctor is mirth or that the work of the clown is health. Furthermore, though we may suppose that mirth is what Ebenezer despises, it would be misleading, and not true *per se*, to say that the clown has the task of producing what Ebenezer despises. So we should not say that the work of the clown is what Ebenezer despises. Both the work and that of which it is the work must be referred to under appropriate descriptions, if the attribution of work to thing is going to be true *per se* and without qualification. The same goes for attributions of final causes and of formal causes. An upshot of this for my semi-formal argument is that it must employ substitutional, rather than objectual, quantification. In other words, the letters '*A*', '*B*', etc. should be thought of as standing in for noun phrases, rather than referring to objects directly in a description-neutral way.

Third, when I say that something 'is there', I mean that the item both exists and is the relevant sort of thing. (Furthermore, since Aristotle says that 'is' is sometimes ambiguous between 'potentially is' and 'actually is', I should note that I mean 'actually'.) For example, 'the axe is there' means that the axe exists and is an axe. The second conjunct is included in case Aristotle would allow (I do not know whether or not he would allow this) that the item that is actually an axe could exist without being an axe. If he would allow this, then an axe's formal cause is something that necessarily is there so long as the axe is an axe, but is not necessarily there so long as the item in question exists.

Fourth and last, a word about the kinds of things my argument

is intended to apply to. Above all, I want the argument to apply to embodied animal and plant kinds, for example *horse*, *human*, and *oak*.[20] This constitutes the central challenge to Aristotle's assertion of sameness between formal and final causes, since embodied living things are generally taken to be the primary case in which sameness holds good. The argument also applies to kinds of animal and plant part which have a work, such as *hand*, *eye*, and *leaf*. We may refer to these as 'functional parts'. (I wish to exclude gerrymandered parts, such as a part consisting of some liver and some intestine, as well as any useless parts Aristotle may have believed certain living things to possess.) Finally, the argument applies to kinds of man-made instrument or artefact, such as *axe* and *house*. Perhaps the argument could be extended to other kinds as well, but I will focus on these three: embodied organisms, functional parts of embodied organisms, and man-made instruments.

Some of the premisses will still require clarification, but I have now said enough to allow a presentation of my semi-formal argument:

For any A, B, and C, where A belongs, as such, to a kind of animal, plant, functional animal or plant part, or man-made instrument:

(1) A has a work.
(2) If C is the work of A then C is a final cause of A.
(3) If C is the work of A then it is possible that A is actually there while C is not actually there.
(4) If B is the formal cause of A then, necessarily, if A is actually there then B is actually there.
(5) If C is the work of A and B is the formal cause of A then it is possible that B is actually there while C is not actually there. (From 3, 4)
(6) If C is the work of A and B is the formal cause of A then C is not the same as B. (From 5)
(7) If B is the formal cause of A then for some D, D is a final cause of A and D is not the same as B. (From 1, 2, 6)

Recall that the argument employs substitutional quantification (one should think in terms of substituting noun phrases for the letters

[20] The qualification 'embodied' is needed because Aristotle at least once refers to an immaterial substance, namely god, as an animal (*Metaph.* *Λ* 7, 1072^{b}28–9). The premisses of my argument would not all hold true of immaterial substances according to Aristotle.

A, *B*, *C*, and *D*, as opposed to assigning them direct reference to objects), and that the phrase '*per se*' is to be understood liberally throughout.

Now, let us consider what grounds there are for thinking that Aristotle would be committed to accepting each step in the argument. Afterwards, I will discuss a few approaches which might be taken to answering the argument and upholding Aristotle's claim that formal and final causes are (often) the same.

3.1. A *has a work*

The first premiss of the deduction is that every animal, plant, functional animal and plant part, and man-made instrument has, as such, a work.

The premiss trivially holds true of functional animal and plant parts, since these were stipulated to be those parts which have a work. The only question could be whether, for Aristotle, there *are* any such parts. The answer to this is undoubtedly affirmative. Aristotle refers to the works of various animal parts—most typically hands and eyes—both in his biological writings and in physical, metaphysical, and ethical contexts.[21]

The case of instruments seems equally straightforward. For example, Aristotle indicates in the *Meteorology* (4. 12, $390^{a}13$) that an axe has a work, in the *Metaphysics* (*B* 2, $996^{b}7$) that a house has a work, and in the *Politics* (7. 8, $1328^{a}31$) that instruments in general have works.

Finally, in the *Nicomachean Ethics* (1. 7, $1097^{b}24$ ff.) Aristotle appeals to a work of man, and in *Generation of Animals* he speaks of the works of plants and animals quite generally:

> Of the being of plants, there is no other work and no other action than the generation of seed; of an animal, on the other hand, generation is not the only work (for this is common to all living things), but all animals partake also of some sort of knowledge—some of more, some of less, some of very little indeed. (*GA* 1. 23, $731^{a}24$–33)[22]

Now, some commentators have urged that Aristotle's attribution of works to entire living beings should be treated with caution. Martha

[21] For example, *HA* 10. 1, $633^{b}18$–29 (eye and womb); *PA* 4. 10, $690^{a}30$–$^{b}2$ (hands and feet); *De somno* 1, $454^{a}26$–30 (eye, hand, and something whose work is perception in general); *Meteor.* 4. 12, $390^{a}10$–15 (eye, flesh, and tongue); *Metaph. Z* 11, $1036^{b}30$–2 (hand); *NE* 1. 7, $1097^{b}30$–2 (eye, hand, foot, 'and altogether each of the parts [of a man]').

[22] See also *GA* 1. 4, $717^{a}21$–2.

Nussbaum claims, for example, that according to Aristotle's core notion of a work, something can have a work only if it acts as part of a larger system, of whose activity its work will be a constituent. Since Aristotle does not think of animals and plants as forming parts of a larger system in the appropriate way, it would follow that they do not have a work in the core sense. Nussbaum concludes that when Aristotle ascribes a work to an animal or plant (in particular, when he writes in the *Ethics* of a work of man), he is relying on a rather loose analogy. 'Work' in such a case means no more than a characteristic or distinctive activity.[23]

Similar reservations are expressed by David Bostock. Bostock assumes that a work in the proper sense is only had by instruments, because a thing's work is always 'useful for something further'. Since an animal or plant is not an instrument, and its activity is not useful for something further, Bostock thinks it is wrong or at best misleading to call its activity a work.[24]

I suspect that these reservations come from reading modern philosophical notions of function back into Aristotle's notion of *ergon* ('function' being the commonest translation of the Greek word). It is true that numerically the greatest quantity of works in Aristotle are attributed to parts and to instruments, but that could be explained in various ways: the works of parts and instruments are more easily and less controversially identified than those of whole plants and animals; perhaps there simply are more parts and instruments than there are wholes and users; and so on. It does not show that Aristotle had no single notion of a work which was applicable both to activities or products of parts and instruments, and to activities or products of wholes which are not instruments. A thing has as its task to do such-and-such. Why should it do this task? Well, perhaps because doing so would contribute to something further, but perhaps because doing so would be intrinsically valuable. The difference between mere usefulness and intrinsic value is indeed important; but this does not preclude there being a common relation of the thing to what it does in both cases. Aristotle himself speaks in the same way of a tool's work, of a part's work, and of an animal or plant's work, and to my mind no persuasive case, whether textual or philosophical, has been made against accepting what he

[23] M. Nussbaum, *Aristotle's* De motu animalium*: Text with Translation, Commentary, and Interpretive Essays* (Princeton, 1978), 81–5 and 100–2.

[24] Bostock, 'Aristotle's Theory of Form', 88 (see esp. n. 21).

says literally.[25] Thus there is good reason for attributing to Aristotle the view that every animal, plant, and instrument, along with many animal and plant parts, has, as such, a work.

3.2. *If* C *is the work of* A *then* C *is a final cause of* A

The second premiss of the deduction is that the work of each animal, plant, working animal and plant part, and man-made instrument is, as such, a final cause of it.

Aristotle's commitment to the truth of this premiss is evidenced, first, by two general pronouncements made in *De caelo* and the *Eudemian Ethics*, respectively:

> Each of the things that has a work is for the sake of the work. (*De caelo* 2. 3, 286^{a}8–9)

> The end of each thing is its work. (*EE* 2. 1, 1219^{a}8)

Now, the sentence from *De caelo* appears to float somewhat free of its context: it is not obvious what role it plays, if any, in the argumentation surrounding it. Because of this, its evidential weight might be queried. If it were our only evidence, it could be regarded as a mere one-off assertion, something Aristotle no doubt believed when he said it but which did not occupy any central position in his network of beliefs, and which he could easily have given up.

The pronouncement from the *Eudemian Ethics*, on the other hand, does get relied upon in the text which ensues. Aristotle's argumentation relies first on an identity between the works and the ends of states (*hexeis*), including arts, perceptual abilities, and bodies of theoretical knowledge. He then extends his argument to apply to soul and its parts. Thus even if he could have stopped short of a completely general identification of work and end, his argument does evince a commitment to the view that at least for every *state* and for every *soul* and *soul part*, the work is a final cause.

Let us consider a few more passages. In the *Politics* Aristotle offers the example of an instrument and its work as illustrative of one thing being for the sake of another:

> When one thing is for the sake of another . . . I mean, for example, every instrument in relation to the work that comes about . . . (*Pol*. 7. 8, 1328^{a}28–31)

[25] Here I am in agreement with M. R. Johnson, *Aristotle on Teleology* [*Teleology*] (Oxford, 2005), 219.

According to this text, the work of any instrument is a final cause of the instrument.

Another class of things to consider are animal parts. Aristotle indicates in *Parts of Animals* that each of these exists for the sake of its work:

> Hence the body is, in a way, for the sake of the soul, and its parts are for the sake of the works to which each is naturally suited. (*PA* 1. 5, 645^{b}19–20)

(The sense in which the body is for the sake of the soul is, I take it, a special one; see Section 4.3, especially n. 61.) Moreover, in particular cases such as teeth, he refers to the same things both as the work and as the final cause of the part in question.[26] He also sometimes combines talk of work with talk of final causation, for example in *Parts of Animals*:

> Animals also have the nature of a mouth *for the sake of these works*, as well as—in those animals that breathe and are cooled from outside—for the sake of breathing. (*PA* 3. 1, 662^{a}16–18)

A further reason to think that the work of an animal part is a final cause of it derives from Aristotle's repeated description of animal parts as instruments.[27] We just saw that according to the *Politics*, every instrument is for the sake of its work. If animal parts are instruments, then in their case too the work is a final cause.

Finally, we must consider the case of whole animals and plants. It is difficult to find direct evidence relating specifically to these items.

In *De somno* 455^{b}22–5 Aristotle seems to say that waking activity (*egrēgorsis*), in particular perceiving and thinking (*aisthanesthai*, *phronein*) is the end of everything that is capable of them, hence of every animal.[28] We saw that in *Generation of Animals* Aristotle spoke of the work of animals as being 'some sort of knowledge'

[26] Teeth are *for the sake of* nourishment, in some animals also for defence, and in humans for speech (*GA* 5. 8, 788^{b}3–6); the *work* of teeth is the preparation of nourishment, in some animals also defence (*PA* 2. 9, 655^{b}8–11; see also *PA* 4. 11, 691^{b}19–20; *GA* 2. 6, 745^{a}27–30; 5. 8, 788^{b}30–3).

[27] *DA* 2. 1, 412^{b}1–4 (the parts of plants too [sc. like the parts of animals] are instruments); *PA* 3. 6, 669^{a}13 (the lung is an instrument of breathing); 4. 10, 687^{a}11 (hands are an instrument); 4. 12, 694^{b}13 (nature makes instruments [sc. body parts] with a view to their work); *GA* 1. 2, 716^{a}24–5 (the parts of the body are instruments for an animal's powers).

[28] *ἡ δ' ἐγρήγορσις τέλος· τὸ γὰρ αἰσθάνεσθαι καὶ τὸ φρονεῖν πᾶσι τέλος οἷς ὑπάρχει θάτερον αὐτῶν. βέλτιστα γὰρ ταῦτα, τὸ δὲ τέλος βέλτιστον*. I have some reservations about relying on this passage, because, strictly speaking, Aristotle says that waking activity is an end *for* animals, not that it is an end *of* animals.

(*gnōsis tis*). In the continuation of that passage Aristotle went on to specify that he regards perception as a sort of knowledge.[29] Thus we can identify the 'sort of knowledge', which Aristotle in *Generation of Animals* attributes to all animals as their work, with the perception and thought referred to in *De somno* as an animal's end. In this pair of passages, then, Aristotle would refer to the same thing as the work and as a final cause of each animal.

3.3. *If* C *is the work of* A *then it is possible that* A *is actually there while* C *is not actually there*

The next premiss of the deduction is that every animal, plant, functional animal and plant part, and man-made instrument can exist and be an animal etc. of the kind in question while its work is not actually there. I have not found a text in which Aristotle says explicitly that this is so, but it seems obviously true. Axes, teeth, and eyes surely do not start and stop existing every time we start and stop chopping, biting, and seeing. Again, the work of an animal is not actually present while the animal sleeps, but animals do not start and stop existing every time they wake up and nod off.

Perhaps the strongest textual evidence to be found is the following. In a handful of passages, Aristotle draws a connection between a thing's work and the conditions on the thing's existence. In each case he says that it is impossible for a thing of a given kind to exist if it is not *capable* of performing or producing the relevant work. It would be very difficult to explain Aristotle's mention of capability if he had held the simpler and stronger view that each thing could not exist unless actually performing or producing its work. Consider:

> Furthermore, there cannot be a hand disposed in any arbitrary way, such as a brazen or wooden hand, except homonymously, like a drawing of a doctor. For it *will not be capable* of producing its own work . . . (*PA* 1. 1, $640^{b}35$–$641^{a}2$)

> All things are defined by the work: for those things that *are capable* of producing their own work truly are each thing, such as an eye if it sees, whereas what *is not capable* [is the thing] homonymously. (*Meteor*. 4. 12, $390^{a}10$–12)[30]

To these passages we may add *De anima* 2. 1, $412^{b}10$–$413^{a}1$. There

[29] *αἴσθησιν γὰρ ἔχουσιν, ἡ δ' αἴσθησις γνώσίς τις* (*GA* 1. 23, $731^{a}33$–4).

[30] Another passage: *Metaph. Z* 10, $1036^{b}30$–1 (something is a hand only if it is capable of accomplishing the work: *δυναμένη τὸ ἔργον ἀποτελεῖν*).

Aristotle clarifies his account of soul by means of analogies to an axe and to an eye. He states that the substance of an eye is sight (*opsis*, $^{b}19$), and that without sight nothing is an eye except homonymously. Sight is the capacity for the activity of seeing (*horasis*, cf. $412^{b}28$–$413^{a}1$), and, as we know from other texts, seeing is the work of an eye (*HA* 10. 1, $633^{b}19$–22; *De somno* 1, $454^{a}26$–9). Thus the substance of an eye, that which stands to an eye as soul stands to an animal, and without which an eye does not exist, is the *capacity* for performing the eye's work. Surely, then, the capacity suffices: a thing of a given kind can exist and belong to the kind while its work is not actually present.

3.4. *If* B *is the formal cause of* A *then, necessarily, if* A *is actually there then* B *is actually there*

The final premiss of the deduction is that nothing of a given kind can exist and belong to the kind while the formal cause of it (as member of the kind) is not actually there. Similar to the previous premiss, this was perhaps for Aristotle a truth too obvious to state. I can point to no passage where the thesis is asserted in generality, but it seems both clear and generally agreed that Aristotle held it.[31] It is strongly suggested by remarks such as the following:

> Moreover, matter is potentially because it could proceed into the form; and when it is actually, then it is in the form. (*Metaph.* *Θ* 8, $1050^{a}15$–16)

According to this passage, some given matter will actually constitute a given thing only when the appropriate form is actually there informing the matter. Aristotle does not state that this is *necessarily* so, but it is plausible that he intends to be offering a scientific truth here, and, according to Aristotle, scientific truths are necessary truths.[32]

The thesis is also suggested in Aristotle's explanations of particular cases. For example, when he analogizes in *De anima* 2. 1 between animals, axes, and eyes, he says of the formal cause of each of the latter two that 'if it were separated off' (or 'went away'), 'there would

[31] For one example from the secondary literature see J. L. Ackrill, 'Aristotle's Definitions of *Psuchê*' ['*Psuchê*'], in M. Nussbaum and A. O. Rorty (eds.), *Essays on Aristotle's* De anima [*Essays*] (Oxford, 1992), 65–75 at 68: 'The form is what the matter has to get or have if it is to become or be an *X*; for the matter, to become or to be an *X* is precisely to get or to have the form.' Presumably the 'has to' in 'has to get or have' expresses necessity.

[32] *Post. An.* 1. 2, $71^{b}15$–16; see also 1. 4, $73^{a}21$–3; 1. 6, $74^{b}6$, $75^{a}12$–13.

no longer be an axe' (or 'eye').[33] Here, as in the passage above from the *Metaphysics*, it is plausible that Aristotle intends to be offering scientific, hence necessary, truths. Thus the presence of the formal cause of an axe or eye is a necessary condition on being an axe or eye.

Here is a further consideration. Aristotle's phrases for referring to formal causes include 'the what is it' (*to ti esti*), 'what it is to be the thing' (*to ti ēn einai*), and 'the being' (*hē ousia*). Where *K* is a kind of thing, it seems obviously necessary that every actually existing *k* actually exemplifies what a *k* is, what it is to be a *k*, and the being of a *k*.

This point is reinforced if we recall the close connection in Aristotle between formal causes and definitions. The definition of a kind of thing specifies what the form of this kind of thing is.[34] Thus, necessarily, if something actually satisfies the definition of a *k* then it actually exemplifies the formal cause of a *k*.[35] It moreover seems clear that, necessarily, all actually existing members of a given kind actually satisfy the definition of that kind. At any rate, this is strongly suggested by Aristotle's statements in the *Posterior Analytics* that definitions are among the principles of demonstrations and that the principles of demonstrations are necessary.[36] Putting all this together, it follows that, necessarily, all actually existing members of a kind actually exemplify the formal cause of that kind.

3.5. *If* C *is the work of* A *and* B *is the formal cause of* A *then it is possible that* B *is actually there while* C *is not actually there*

Now we are ready to draw an inference from premisses 3 and 4. Suppose that *C* is the work of *A* and *B* is the formal cause of *A*. Then it is possible that *A* is actually there while *C* is not actually there (premiss 3), and it is necessary that if *A* is actually there then *B* is actually there (premiss 4). Whenever one proposition is possible and another proposition is necessary, it is possible for the two

[33] *DA* 2. 1, $412^{b}13$–14, 20–1.

[34] See e.g. *Metaph.* *Δ* 8, $1017^{b}21$–2; *Z* 5, $1031^{a}12$; *Z* 11, $1036^{a}28$–9; *H* 1, $1042^{a}17$. For discussion see M. Frede, 'The Definition of Sensible Substances in *Met*. *Z*', in D. Devereux and P. Pellegrin (eds.), *Biologie, logique, et métaphysique chez Aristote* (Paris, 1990), 113–29.

[35] I assume that there is a unique formal cause for each kind. By 'unique' I mean specifically unique—we need not decide whether all *k*s share *numerically* one formal cause; perhaps each individual *k* has its own individual form.

[36] For the first claim see *Post*. *An*. 1. 2, $72^{a}21$ (in conjunction with $^{a}7$, 14–16); 2. 3, $90^{b}24$. For the second claim see *Post*. *An*. 1. 6, $74^{b}5$–6, 15, 18, 26 ff.

propositions to be true together.[37] So it is possible that: *A* is actually there while *C* is not actually there and if *A* is actually there then *B* is actually there. Hence it is possible that *A* is actually there and *B* is actually there while *C* is not actually there. Therefore it is possible that *B* is actually there while *C* is not actually there.

3.6. *If* C *is the work of* A *and* B *is the formal cause of* A *then* C *is not the same as* B

With the above result in hand, we can apply one of Aristotle's tests for sameness from *Topics* 7. 1:

> Moreover, see if it is possible for the one to be without the other: for then they will not be the same. (*Top*. 7. 1, 152^{b}34–5)

Where *C* is something's work and *B* is its formal cause, we have seen that it is possible for *B* actually to be there without *C* actually being there. Applying Aristotle's test, it follows that *B* and *C* are not strictly the same.

3.7. *If* B *is the formal cause of* A *then for some* D*,* D *is a final cause of* A *and* D *is not the same as* B

From premiss 1 we know that every animal, plant, functional part, and instrument has a work. From premiss 2 we know that this work is also a final cause of the animal, plant, part, or instrument. Lastly, we know from line 6 that this work is not strictly the same as the thing's formal cause. Hence, every animal, plant, functional part, and instrument has a final cause which is not strictly the same as its formal cause. This is the conclusion of my argument.

Now that the argument is complete, let me say again, carefully, what its conclusion amounts to. We start with a term denoting, as such, an organism, functional part, or instrument. For example, we may consider the term 'the eye'. Then there will be, on the one hand, a term yielding a true *per se* ascription of a final cause to the thing, and, on the other hand, a term yielding a true *per se* ascription of the thing's formal cause to it. And these latter two terms will figure in a true denial of strict sameness. Continuing the example

[37] See e.g. the theorem called 'K◇' in B. Chellas, *Modal Logic: An Introduction* (Cambridge, 1980), 117. Or think of it this way: the possible proposition is true at some possible world, and the necessary proposition is true at every possible world. So at some world, both propositions are true.

of the eye, the relevant terms would be 'seeing' and 'sight': seeing is *per se* a final cause of the eye, sight is *per se* the formal cause of the eye, and seeing is not strictly the same as sight. I emphasize that my conclusion concerns sameness in the strictest and most dominant sense of the term. For all I have proven, it may yet turn out that a thing's final cause and its formal cause are the same in some weaker sense. Indeed, for all I have proven, it could even turn out that they are identical (in today's sense of 'identical', which may or may not have been a concept employed by Aristotle himself).[38] Carrying on with the eye, it could be that, although seeing is not strictly the same as sight, seeing is identical with sight. I am confident that such an identity does not in fact hold, but I have not proven that it does not hold. We will meet this point again (Section 4.4).

4. Can we preserve (a qualified version of) the sameness claim?

There are many possible strategies for responding to the argument I have given. It is not practicable to consider them all, because the range of interpretations and views in play is so vast and unwieldy. But I would like to touch on a few lines of response which I think raise important issues.

4.1. *Survival and reproduction*

I attributed to Aristotle the view that living things exist for the sake of their works (Section 3.2). An objection might be raised to this based on the idea, often expressed in the secondary literature, that an animal's characteristic activities and products are all directed towards the maintenance or reproduction of the animal itself. The idea suggests that an animal's work is for the sake of the animal's form, in the sense that the work is performed in order to secure the form's continued existence by way of survival and reproduction. A scholar who holds this view may perhaps grant that the work of an animal is its proximate final cause, but insist that its form is also a final cause of it. The form is the higher end to which the work is a means; an animal works in order to maintain and propagate itself, and thereby to further the existence of its form. Thus the ani-

[38] Thanks to Kevin Klement for bringing home to me the fact that my argument does not disprove identity.

mal's form has good title to be called the final cause of the animal. (This line of thought is addressed to whole organisms only; it is not designed to identify the formal and final causes of parts or instruments.)

Such a view is endorsed, for example, by Gareth Matthews:

> Now if the soul of a living thing is the cause of its living, and its living is naturally directed towards the preservation of its species, then the soul's powers (the 'psychic powers' we have been talking about) are presumably powers naturally directed toward the preservation of the species of that particular thing.[39]

The view is also suggested by Jonathan Lear when, after listing some characteristic plant and animal activities, he writes:

> In each case such activities of plants and animals are for the development, maintenance, or protection of form: 'Since nature is twofold, the matter and the form, of which the latter is the end, and since all the rest is for the sake of the end, *the form must be the cause in the sense of "that for the sake of which."*'[40]

What are we to think of this view? To begin, let us grant for the sake of argument that the working of an animal or plant always contributes to survival or reproduction. Then we are faced with a circle: the form promotes the work (since it grounds the ability to work, or is this ability), and the work promotes the form (since it preserves and reproduces the form). In this mutual furthering of form and work, which is for the sake of which? Or, to shift the question, which is the more intrinsically valuable, and which rather derives its value from that of the other?[41]

It seems to me that preference must go to the work, not to the form. The situation is analogous to what we find in the *Ethics* in the relation between virtue and virtuous activity. Virtue is a state which provides, or is, a disposition to act virtuously; acting virtuously develops or reinforces the state of virtue. Aristotle is insistent—

[39] G. Matthews, '*De anima* 2. 2–4 and the Meaning of *Life*', in Nussbaum and Rorty (eds.), *Essays*, 185–94 at 190–1.

[40] J. Lear, *Aristotle*, 35. The passage quoted by Lear is *Phys.* 2. 8, 199^{a}30–2 (the emphasis is Lear's).

[41] When one thing is for the sake of another, normally the latter is intrinsically better than the former. This comes out, for example, in the reasoning about goods and ends in *NE* book 1: see especially *NE* 1. 1, 1094^{a}5–6, and 1. 7, 1097^{a}25–34; also *EE* 2. 1, 1219^{a}8–11.

against Plato—that the higher good is the activity, not the state.[42] As in the practical realm, I say, so in the biological. An activity such as perception or thought is of basic intrinsic value; its value is akin to the value of god's activity. The form of an embodied animal is valuable because it is or provides the ability to perform such valuable activity. Aristotle's higher valuation of activities over capacities seems to be quite general, extending outside his ethical works into the physical and metaphysical.[43] For example, in *Metaphysics Θ* 9 he argues that whenever a capacity is good, the corresponding activity is better.

I started out by granting the claim that, for Aristotle, the working of a living thing always contributes to its own survival or reproduction. I do not think that this should really be granted. In the human case, theoretical activity is an obvious and acknowledged sticking point for the claim. In other animals and in plants, there are no such obvious counter-examples: the activities described in Aristotle's biological works all seem to be connected with getting food, mating, and protecting oneself. Nevertheless, it is important to see that Aristotle's theoretical framework leaves room for animal activities which are performed simply for their own intrinsic value, and not for the sake of any contribution to survival or reproduction. Correspondingly, it leaves room for teleological explanations of animal traits or parts in terms of their usefulness for intrinsically valuable activities, without any regard to considerations of survival or reproduction. This is a crucial difference between Aristotle's framework and the prevailing Darwinian framework of today, and it would be a shame to obscure it or cover it over.

4.2. *Coming to be*

Aristotle's way of referring to final causes consists in a mere fragment of a clause, 'that for the sake of which', and we might wonder how to complete this fragment: that for the sake of which . . . *what*? I have been taking the view that, in the case where *A* is an object such as an animal or a plant, a final cause of *A* is something for the sake of which *A is there*. But one might argue for completing

[42] Cf. *NE* 1. 5, $1095^{b}31$–$1096^{a}2$; 1. 7, $1098^{a}5$–6; 1. 8, $1098^{b}31$–$1099^{a}7$; 10. 6, $1176^{a}33$–$^{b}2$. For the opposite view, on which virtuous action is choiceworthy because of its contribution to one's virtuous state, see e.g. *Rep*. 4, 443 E 5–6 and 445 A 5–B 4.

[43] Cf. *PA* 1. 5, $645^{b}17$–19; *De somno* 2, $455^{b}22$–5; *EE* 2. 1, $1219^{a}8$ and 31.

Aristotle's fragment in some other way. In particular, it might be thought that a final cause of *A* is something for the sake of which *A comes into being*, perhaps also something for the sake of which *A undergoes maturation*.[44] It is uncontroversial that, for Aristotle, things typically come into being in order that their respective forms be instantiated, and it is widely held that organisms undergo maturation in order that their forms be more completely instantiated. So, if this view of final causation is correct, the form of a thing will count as a final cause of that very thing.

But I do not think that this view of final causation is correct, and I would like to indicate why. To begin, let us remind ourselves of two distinctions. First is the distinction between being a cause *of* something and being a cause *to* the thing. For example, if you are enjoying this paper, then the paper is a cause *of* enjoyment *to* you.[45] Generally speaking, being a cause of something *to* X does not suffice for being a cause *of* X.[46] For example, this paper is not a cause of you. But perhaps being a cause to X of *being*, or, as our proposal has it, being a cause to X of *coming into being*, does make something a cause of X. This brings us to our second distinction. We must bear in mind that, for Aristotle, a thing's being and the thing's coming into being are distinct explananda. For example, one of the methodological issues he discusses in *Parts of Animals* book 1 is whether the explanation of an animal's being is prior to or posterior to the explanation of its coming into being (*PA* 1. 1, 640^{a}10 ff.). He could not have asked about the order of priority among these explanations without distinguishing between them; and it is unlikely that he would distinguish between the *explanations* of being and of coming into being without distinguishing between the *causes* of being and of coming into being. After all, he appears to hold that a cor-

[44] This view is not often stated explicitly, but it seems to lurk behind many things that people say. Simplicius pretty much states the view when he describes a thing's final cause as that for the sake of which it *is made* (Simpl. *In Phys*. 363. 28–32 Diels). I suspect that the view is at work in Ross, *Physics*, 526, and in Hankinson, *Cause and Explanation*, 146. The form's role as end of generation is also appealed to in explaining Aristotle's sameness claim by Philoponus (*In Phys*. 298. 3–6 and 301. 22–5 Vitelli) and by Aquinas (*In Phys*. lib. 2, l. 11, n. 2 Maggiolo).

[45] It is common in classical Greek literature and philosophy to have a pair of words in the genitive and dative cases when talking about causation or responsibility. For example, someone or something can be said to be a cause *of* death *to* some men (Lysias, *In Agoratum* 49), a cause *of* goods *to* the city (Plato, *Euthph*. 3 A 2–4), or a cause *of* sterility *to* the lion (*GA* 3. 1, 750^{a}31–2).

[46] The difference between what something is a cause of and what it is a cause to comes out especially clearly in *Post*. *An*. 2. 16–17 (see esp. 98^{b}28–9, 99^{a}5, 99^{b}4–5).

rect explanation of something consists precisely in a specification of its causes. In *Metaphysics Z*, too, Aristotle distinguishes between a cause of something's being and a cause of its coming into being.[47]

One might think that, whenever something explains why a thing came into being, it thereby explains why it is there. But this is not so. Consider the fact that I walked into the library in order to be in the library, whereas it is not the case that I am in the library in order to be in the library. It could have been so (if I pursued inhabitance of libraries for its own sake), but in fact I am there in order to read and work. Being in the library is thus a final cause of my coming to be in the library, but not of my being in the library. Similarly, a cat comes into being in order that the cat's form be instantiated, but it does not follow that the cat exists in order that its form be instantiated. Indeed, given that the cat's existence is *grounded in* the instantiation of the form, it is hard to see how the former could in any way be a means to, or for the sake of, the latter.[48] Thus, it seems, the cat's form is a final cause of the cat's coming into being, but not a final cause of the cat's existence.

When he wishes to be explicit, Aristotle can make it clear which explanandum he is explaining. He sometimes says that one thing is a cause to another of coming into being, or that one thing is a cause to another of being.[49] The question is, what does he mean when, instead of using an 'of . . . to . . .' construction, he says simply that something is a cause of a given object? And what should *we* mean when, in reporting Aristotle's views, we employ this simple form of expression? In our own case, it seems clear that, though we might use the simple expression as equivalent to one or the other of the

[47] *Metaph. Z* 17, 1041^{a}31–2: 'but this sort of cause [i.e. the efficient cause] is sought for coming into being and perishing, while the other [i.e. the final cause] is also sought for being'.

[48] It has become a familiar point in discussions of Aristotle's *Ethics* that his 'for the sake of' relation is more inclusive than a purely instrumental means–ends relation. Even so, in standard examples, such as when I putt for the sake of playing golf or play golf for the sake of having a good holiday (J. L. Ackrill, 'Aristotle on Eudaimonia', in A. O. Rorty (ed.), *Essays on Aristotle's Ethics* (Berkeley, 1980), 15–33 at 19), I achieve the end *because of* or *in virtue of* the thing that is for the sake of the end. I am playing golf in virtue of the fact that I am putting; I am having a good holiday in virtue of the fact that I am playing golf. Now, a cat is there in virtue of its form's being there, not vice versa, so it is implausible that the cat is there for the sake of the form's being there.

[49] Coming into being: *GC* 2. 10, 336^{a}21; *De long. vit.* 465^{a}16; *MA* 700^{a}35–^{b}1; *Phys.* 8. 7, 261^{a}2. Being: *GC* 2. 10, 336^{a}21–2; *DA* 2. 4, 415^{b}12–13; *Cat.* 13, 14^{b}28, ^{b}31–2, 15^{a}9–10.

first two, more elaborate ones, we should not use it in a way that is ambiguous between them. We strive for clarity and precision, and avoid vague or ambiguous expressions. As for Aristotle's usage, it is hard to be certain, but it seems unlikely that he meant '*B* is a cause of *A*' to be ambiguous between '*B* is a cause of being to *A*' and '*B* is a cause of coming into being to *A*'. Aristotle makes a great many distinctions concerning the ambiguities of causal claims, and he does not indicate that there is any ambiguity of this particular kind.

Finally, to complete my argument, there are passages in which Aristotle appears to use 'cause of *A*' interchangeably with 'cause of being to *A*'.[50] If the appearance is correct, and given that we and Aristotle both wish to avoid ambiguity, then 'cause of *A*' should not be used as a proxy for 'cause of coming into being to *A*'. In the case of final causation, this means that we should call *B* a final cause of *A* only if it is a final cause of *A*'s being, that is, only if *A* is there for the sake of *B*, and not if it is merely a final cause of *A*'s coming into being. So, although an organism's formal cause is a final cause of the organism's generation and maturation, this is no good reason for calling the form a final cause of the organism itself.

4.3. *Benefit*

In a handful of passages, Aristotle distinguishes between different senses in which one thing can be for the sake of another.[51] It is worth considering the distinctions he makes, to see if they deliver some sense in which things can plausibly be said to be for the sake of their forms.

The clearest elaboration of a distinction is found in *Generation of Animals* 2. 6. Here Aristotle distinguishes between, on the one hand, something's being there in order to generate or produce a given thing, and, on the other hand, something's being there in order to be used by the thing (*GA* 2. 6, $742^{a}22$–32). For example,

[50] For example, at *DA* 2. 4, $415^{b}11$–13, Aristotle first says that the soul is a cause of living bodies as substance (i.e. as a formal cause), and then says universally that each thing's substance is a cause to it of being. Thus the soul is a cause of the living body and a cause of being to the living body. At *EE* 1. 8, $1218^{b}20$–2, he says first that something healthy is a cause of health (*τῆς ὑγιείας*), and then that it is a cause of health's being (*τοῦ εἶναι τὴν ὑγίειαν*).

[51] In addition to the texts discussed below, see *Phys*. 2. 2, $194^{a}35$–6, *EE* 8. 3, $1249^{b}15$, and perhaps (depending on the correct reading of the text) *Metaph*. *Λ* 7, $1072^{b}2$–3.

a flute teacher is there for the sake of a flautist in the first sense, whereas a flute is there for the sake of a flautist in the second sense.

A much more condensed statement of a distinction is found in *De anima* 2. 4. Here Aristotle tells us that that for the sake of which is 'twofold'; it encompasses (to translate in minimal fashion) 'that of which and that to which'.[52] It is difficult to be sure what he means here. There is fairly wide agreement nowadays that 'that of which' means an end to be attained or realized, and there is wide verbal agreement in saying that 'that to which' means someone or something to be benefited.[53] But the verbal agreement masks a great disparity in understandings of benefit. Some scholars think that to benefit someone is to bring him or her into a better condition.[54] Others think that our enemies can properly be called 'beneficiaries' of the measures we take to frighten them in battle.[55] For these scholars, 'benefit' has a touch of the gangster's euphemism about it, or at any rate a rather broad meaning. Finally, some seem to think that the notion of benefiting something is equivalent to (or encompasses) the notion of being useful to it.[56]

The third understanding of benefit has the advantage of making Aristotle's distinctions in *De anima* and *Generation of Animals* line up pretty well with each other. I have no objection to it considered as an interpretation of the *De anima* passage, but I would like to plead for more differentiated terminology. There are many reasons for keeping the notion of benefit clearly separated from the notion of usefulness. For one thing, it is widely assumed that something can be benefited, or 'benefited', only if it is changeable.[57] But it is possible to be useful to an art, which is presumably not (*per se*) changeable.[58] Moreover, as Plato has Socrates argue in *Republic* 1,

[52] *DA* 2. 4, 415^{b}2–3 and 20–1. 'That of which' translates *τὸ οὗ*, and 'that to which' translates *τὸ ᾧ*. Other translations are possible based on the variety of relations which can be expressed in Greek by means of the genitive and dative cases.

[53] See e.g. P. McLaughlin, *What Functions Explain* (Cambridge, 2001), 20; S. Menn, 'Aristotle's Definition of Soul and the Programme of *De anima*' ['Programme'], *Oxford Studies in Ancient Philosophy*, 22 (2002), 83–139 at 113; G. Lear, *Happy Lives and the Highest Good* [*Happy Lives*] (Princeton, 2004), 75–6; Johnson, *Teleology*, 66–7.

[54] Lear, *Happy Lives*, 75.

[55] Johnson, *Teleology*, 67 n. 8.

[56] Stephen Menn writes of being for the sake of something as 'the to-benefit-whom, as an *ὄργανον* is for the sake of the art or the artisan' (Menn, 'Programme', 113).

[57] Lear, *Happy Lives*, 76; Johnson, *Teleology*, 76.

[58] Menn emphasizes that an art can be the 'to-benefit-whom' (as he calls it) of an instrument ('Programme', 113).

and as Aristotle repeats in *Politics* 3. 6, exercises of an art typically do not, as such, aim at the artisan's own benefit.[59] Accordingly, being useful to an artisan, which means serving her in the achievement of her aim as artisan, will not typically benefit her. For example, if a doctor is treating my friend and I fetch some bandages, I do this in order to benefit my friend, not the doctor; I do it in order to be useful to the doctor, but not in order to benefit her. Finally, we should recall how, in Plato's *Euthyphro*, Socrates and Euthyphro strenuously deny that we can improve or benefit gods. The thought that we might serve gods and be used by them is introduced as an alternative idea, and is not rejected.[60] For all these reasons and more, a distinction must be respected between being for something's use and being for something's benefit.

There is more to say about all this, but the immediate question is whether these distinctions reveal a sense in which a thing's form is a final cause of the thing. Is there any plausibility, say, to the thought that animals or plants, or parts, or instruments, exist for the sake of being useful to their respective forms? Or, alternatively, is it plausible that these things exist for the sake of benefit to their respective forms?

The 'usefulness' proposal is reminiscent of something Aristotle says. He says, namely, that each organism's *body* is an instrument of the organism's soul, and exists for the sake of the soul in the sense of being there for its use.[61] It does not immediately follow that the organism itself is for the sake of its soul, given that (I think) an organism is not the same as its body. To be sure, an organism is a body, a *living* body (*DA* 2. 1, 412^{a}15–16), but the living body is to be distinguished from the organism's *instrumental* body. If I understand Aristotle rightly, his view is that the living body is a composite substance whose proximate matter is the instrumental body and whose form is the soul (*DA* 2. 1, 413^{a}2–3). If this is correct, then it is plausible that the soul is the formal cause of the living body but not of the instrumental body, and that it is a final cause of the instrumental body (in the sense that the instrumental body is for its use) but not of the living body. Thus I do not see how, along these lines, we can

[59] *Rep.* 1, 346 D 1–6 and E 3–7; *Pol.* 3. 6, 1278^{b}37–1279^{a}5.

[60] *Euthph.* 12 E 5–14 A 10, esp. 13 C 6–9 (talk of benefit and of making better, *ὠφελία* and *βελτίους ποιεῖν*) and E 10–11 (talk of servants and of using, *ὑπηρέται* and *χρῆσθαι*).

[61] *DA* 2. 4, 415^{b}18–20. The statement at *PA* 1. 1, 645^{b}19, 'the body is in a way for the sake of the soul', should, I think, likewise be understood in terms of the thought that the body is an instrument for the soul's use (cf. 642^{a}11).

make the soul come out as the formal cause and a final cause of one and the same thing. Perhaps it can be done, but I am not optimistic.

What of the 'benefit' proposal? Aristotle does seem to hold that an animal's being is a benefit to it: he says that being is choiceworthy and lovable, and that a child's being is a great service done to it by its father.[62] It is not implausible to assign the enjoyment of benefits specifically to the animal's soul, and thus to say that the animal's being is a benefit to the animal's soul. However, it is difficult to go further than this, and to claim that we have here a partial explanation of why the animal exists. Though it is plausible that each animal's existence *is* a benefit to the animal's soul, it is neither intuitively plausible nor (to my knowledge) ever asserted by Aristotle that each animal exists *for the sake of* this benefit to the animal's soul. Perhaps this strategy can somehow be carried off, but again I am not optimistic.

4.4. *Sameness of activity and capacity*

I would like to mention one last strategy for upholding a kind of sameness between formal and final causes. I have not seen the strategy pursued in print, but it has arisen often in conversation about the argument presented in Section 3 above.[63] An interlocutor begins by granting that a thing's formal cause and its final cause are, in a way, different. In particular, he says, typically a thing's formal cause is a capacity while its final cause is the corresponding activity. For example, an animal's formal cause, its soul, is a complex capacity for certain life activities, and the animal's final cause is those life activities. But then, the interlocutor proceeds, a capacity and the corresponding activity are the same.

It remains to spell out what kind of sameness is at issue. As an opening move, the interlocutor notes that a capacity and an activity can typically be referred to by the same linguistic expression. For example, if Aristotle says that something 'sees' (*horai*), this can mean either that the thing is able to see, or that it is actively seeing. If something 'lives' (*zēi*), this can mean either that it is alive, or that it is actively performing life activities (cf. *NE* 1. 7, 1098^{a}5–6). So we can answer the question of essence and the question of end with the

[62] *NE* 9. 7, 1168^{a}5–6; 8. 11, 1161^{a}15–17.

[63] The strategy addressed in this section has been defended in discussion (whether from conviction or for dialectical purposes) by Stephan Schmid, Christian Pfeiffer, Antonio Vargas, Jonathan Beere, Gavin Lawrence, and Calvin Normore.

same form of words. What is the essence of an eye? To see. What is an eye for? To see. What is the essence of an animal? To live. What is an animal for? To live.

In my own view, this is mere homonymy, not real sameness among the things talked about. But the interlocutor insists that the linguistic sameness points to a genuine metaphysical one. He reminds us of Aristotle's famous doctrine that, among the ways in which being is spoken of, there is *being-in-capacity* and *being-in-activity*.[64] And, if he is willing to commit himself to any definite way of working this all out, he proposes the following.[65] Aristotle's view is that in each case where there is a capacity and an activity, there is some single selfsame item which, when it enjoys being-in-capacity, is rightly called by the name of the capacity (e.g. 'sight' or 'soul'), and, when it enjoys being-in-activity, is rightly called by the name of the activity (e.g. 'seeing' or 'living').

The core of this proposal is that seeing, or singing, or whatever other activity, is identical with the capacity for seeing or singing or whatever other activity. When I undergo a transition, say, from being merely capable of singing to actually singing, this is not a matter of acquiring a further property, *singing*, additional to the property *capable of singing* which I already had. Rather, what happens is that my capacity for singing somehow 'rises into' another mode of being, in such a way that it itself is then the property of singing.

The proposal ought to be very controversial. It would take quite a lot of work to show that it is (*a*) philosophically intelligible and (*b*) plausibly regarded as Aristotle's view. It raises deep and interesting metaphysical issues, which is why I mention it. But for the same reason, it is impossible to give it adequate treatment in the present paper. Moreover, I find myself unable to say even a little about it without saying quite a lot. So I will content myself with one small objection: it would be surprising if Aristotle's remark about formal and final causes, made in an easy tone in works of biology and natural science, should turn out to depend on such a subtle and difficult doctrine, which ingenious commentators claim to have teased out of the *Metaphysics*.

[64] *Metaph.* Δ 7, 1017^{a}35 ff.

[65] Presumably there are several ways one could go from here, but what follows is the only concrete proposal I have heard.

5. Conclusion: rewards of shaking off the sameness claim

I have argued that Aristotle is committed to accepting the result that a thing's formal cause and its final cause are not, strictly speaking, one or the same. On one level this represents a difficulty in the interpretation of Aristotle, given his repeated claim that a thing's formal and final cause are one and the same. There are countless ways in which one might try to solve or remove the difficulty, and it would of course be good to come to an agreement on the best solution (or rejection) of the problem. But for the moment I would like to recommend that Aristotle's sameness claim simply be set aside and, temporarily, left out of consideration. Let us look at the rest of Aristotle's physical works, his biology, and his metaphysics, and see what picture suggests itself of formal and final causes when we have discarded the preconception that these causes must somehow coincide. I would like to sketch a picture which I find attractive, and which I think is fairly widely shared. The picture concerns both what Aristotle's concepts of a formal cause and of a final cause are, and which items fall under these concepts in relation to material substances. I do not guarantee the picture's complete accuracy and faithfulness to Aristotle, but I think it is a reasonable place to work from. It is as follows.

To be the formal cause of an individual of a given kind, as member of the kind, is to be that in virtue of whose presence the individual belongs to the kind in question. If the kind is a substantial kind, then being the formal cause also means being that in virtue of whose presence the individual exists. For example, the art of medicine is the formal cause of a doctor as doctor: the individual belongs to the kind *doctor* in virtue of the presence of the art of medicine. For another example, the human soul is the formal cause of a human as human: the individual both exists and belongs to the kind *human* in virtue of the presence of the soul. In the first example, the individual exists regardless, and the formal cause merely grounds the fact that it is a certain sort of thing. In the second example, the very existence of the individual depends on the presence of the formal cause. The individual is composed out of a plurality of things or stuffs, and it is precisely in so far as the components are jointly informed by soul that they compose an individual. In the soul's absence, there would be some things or some stuff there, but

there would be no individual composed out of those things or that stuff.

A formal cause, then, is a metaphysical ground of kind-membership and, in some cases, of existence by composition.

What sorts of thing play the role of formal cause for Aristotle? Sometimes he gives the example of a shape, as in the case of a statue (*Metaph. Z* 3, 1029^{a}3–5). Or it might be some other sort of structure or arrangement, such as (to borrow a example from Ackrill) the arrangement by which bread and cheese compose a sandwich.[66] But an especially central sort of case is that in which the formal cause is a capacity to do or to make something. Man-made instruments have such formal causes: a thing is an axe in virtue of the capacity to chop wood, a house in virtue of the capacity to shelter bodies and goods. Many animal parts are like this too: a thing is an eye in virtue of the capacity to see, a hand in virtue of the capacity to grasp. Souls also—the formal causes of animals and plants—are capacities to do things such as to perceive, to move about, and (in the human case) to think. Thus the formal cause of a living thing is the capacity to perform certain life activities.

Now let us turn to final causes. Aristotle describes this sort of cause elliptically, as 'that for the sake of which'. Filling out his description, it is plausible to suppose that the final cause of a change or action is that for the sake of which the change occurs or the action is performed; and the final cause of a thing is that for the sake of which the thing is there. In particular, to be the final cause of an individual of a given kind (as member of the kind) is to be that for the sake of which the individual belongs to the kind in question, and, in some cases, to be that for the sake of which the individual exists altogether.

Aristotle's reasons for regarding this as a kind of cause seem to be based on the following observation. A statement of the form '*p* in order that *q*', if true, is a felicitous answer to the question 'why *p*?' (*Phys.* 2. 3, 194^{b}33–5). In this way, clauses of the form 'in order that *q*' stand alongside clauses of the form 'because *r*' in their explanatory force. Similarly, the question why *A* is there is properly answered by a true statement to the effect that *A* is there for the sake of *B*. So again, clauses of the form 'for the sake of *B*' stand alongside clauses of the form 'because of *C*' or 'as a result of *C*' in their explanatory force. It may be thought that, since statements of

[66] Ackrill, '*Psuchê*', 66.

the form 'in order that . . .' and 'for the sake of . . .' count as answers to 'why' questions, they must somehow be translatable into statements of the form 'because . . .' or 'as a result of . . .'. But I think we should keep an open mind about this. Doubtless, 'in order that' statements stand in inferential connections with certain sorts of 'because' statements,[67] but these connections are complex and will most likely not lead to any straightforward translation, definition, or reduction.

What plays the role of final cause? Well, typically, where a kind is defined by a capacity, the final cause will be the activity or the thing which kind-members are able to do or to make. (I offer this as a general rule, not as a necessary or conceptual truth.[68]) For example, the art of medicine is a capacity to produce health, and a person is a doctor for the sake of health: health is the final cause of a doctor. Similarly, a house exists for the sake of sheltering bodies and goods, and an eye exists for the sake of seeing. A living thing exists for the sake of certain life activities: those activities are the final cause of the living thing.

On this picture, although the final cause of a house is closely related to the formal cause of the house, the causes are not the same. Its formal cause is the capacity to do something; its final cause is that which it is able to do, namely to shelter. Similarly, the final cause of a living thing, such as a cat, is related to but different from the thing's formal cause. The formal cause is a capacity (this is why the cat still exists while asleep), while the final cause is the corresponding activity. If the argument of this paper is acceptable, then we should not let Aristotle's sameness claim deter us from adopting the picture I have just sketched; we should consider adopting it even though 'it is clear that capacity and activity are different' (*Metaph.* *Θ* 3, $1047^{a}18$–19).

What, in the end, should we think of Aristotle's assertion of the

[67] For example, Aristotle indicates that a final causal explanation can sometimes be given in the form 'because it is better thus' (διότι βέλτιον οὕτως: *Phys.* 2. 7, $198^{b}8$–9). Also, some of his arguments presuppose connections between final causes and efficient causes: for example, he evidently assumes that if a process is efficiently caused entirely by weight and heaviness, then the process does not occur for the sake of covering and preserving (*Phys.* 2. 9, $200^{a}5$–7).

[68] One exception to the rule might be a doomsday machine, if, as is plausible to think, (*a*) its essence is a capacity to destroy life on earth under certain conditions, but (*b*) it does not exist in order to destroy life on earth under those conditions. (On (*b*), remember what Dr Strangelove says: 'The *whole point* of the doomsday machine is lost if you keep it a secret.')

sameness claim? I am inclined to think that Aristotle was speaking loosely, or was making a subtle mistake. Relative to his own purposes, the mistake is minor and easily corrected. For there are truths in the neighbourhood of the sameness claim, and the neighbouring truths can do the work that Aristotle needs done. Aristotle is mainly concerned with the question how a scientist should go about describing the causes of things, and his main message is that the scientist need not list formal causes and final causes separately. For example, in the passage we saw in *Generation of Animals*, his whole point seems to be that, having discussed the formal causes of animals, he need not give an additional set of lectures on their final causes. This point is reasonable provided only that a thing's final cause can be easily *inferred* from its formal cause, regardless of whether it is strictly the same as it; and the latter claim is plausible in Aristotle's theoretical framework. Aristotle's train of thought goes through, and relative to this his mistake or loose expression is harmless. Relative to *our* purposes, on the other hand, when we are trying to elucidate and reconstruct Aristotle's causal concepts, the mistake is harmful and it is crucial to recognize it as such. It encourages inaccuracy in the identification of causal relations and relata. And it obscures the fact that many ends in Aristotle's natural world—indeed the highest ends, I think—are not forms, but rather activities such as perceiving and knowing.

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