

ORGANIC UNITY AND THE MATTER OF MAN

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1. Introduction

IF we assume, as many have, that Aristotle's discussions of artefacts provide us with a characterization of matter and form that is applicable to hylomorphic composites outside the artefactual domain, then a candidate for the matter of any composite must satisfy an important requirement:

(CS) *Contingent Specification*. For any hylomorphic composite with a given form, the matter of the composite must (1) be capable of being so formed, (2) be actually present in the composite, and (3) be identifiable independently of its having such a form.

Phys. 2. 1, 193^a9 ff., offers the all too familiar illustration. The same bronze is present before, during, and after it has the form of a statue; that is, it persists as such through the statue's generation and destruction. Though the bronze has the capacity to take on the form of a statue, its identity bears no necessary relationship to that form.

The attribution of a unitary account is to be preferred in one's exegetical endeavours, but it is difficult to do so in this case.¹ For when we consider living composites, those composites whose form is soul (*ψυχή*), the obvious candidates for matter fail the CS test, specifically the condition that the identity of the matter of a composite be

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¹ The *locus classicus* for this difficulty is J. L. Ackrill, 'Aristotle's Definitions of *psuchē*', *Proceedings of the Aristotelian Society*, 73 (1972), 119–33.

independent of that composite's form. This failure is manifest in Aristotle's application of the *homonymy principle* to the matter of living composites. An object is an *F* homonymously if it is called an *F* but differs from proper *F*s, either partially or completely, in its account/definition/essence/nature.² Aristotle is explicit that the candidates for the matter of a living composite—the body, the organs, and even the tissues—are not identical to any objects present in a corpse that we would ordinarily call by these names.³ The body, organs, and tissues present when the composite is no longer alive, i.e. no longer ensouled (*ἔμψυχος*), are *not* the body, organs, and tissues except homonymously (*πλὴν ὁμωνύμως*).

The homonymy principle has an application here, commentators say, because it is applicable whenever something is identified, at least in part, by its function. And the matter of a living composite *is* identified, by Aristotle, in this way. The matter in such cases is 'a natural body which has organs' (*DA* 2. 1, 412^a28), and to be an organ is to have the capacities necessary to perform a characteristic *ergon*—a work, job, or function:

What a thing is is always determined by its function: a thing really is itself when it can perform its function; an eye, for instance, when it can see. (*Meteor.* 4. 12, 390^a10–12)⁴

Thus, for the matter of a living composite—an organic body—to exist, it must have the capacities necessary to work in a particular way. But the capacities that a body must be able to exercise in order to be organic are the very same capacities that constitute a body's being ensouled. So the matter of a living composite, an organic body, is necessarily ensouled. If this is correct, we must countenance at least two fundamentally different hylomorphic accounts—one for composites with contingently specifiable matter and one for composites with essentially informed matter.

But hope for a unitary account of hylomorphism in which artefacts retain their principal station has not entirely been extin-

² These variations need not trouble us at this stage of the argument.

³ See e.g. *GC* 1. 5, 321^b29–32; *Meteor.* 4. 12, 390^a10–12; *DA* 2. 1, 412^b12–13; 412^b21–3; *PA* 1. 1, 640^b34–641^a34; *GA* 2. 1, 734^b24–7; *Metaph. Z* 10, 1035^b10–26; *Pol.* 1. 2, 1253^a19–25.

⁴ Except for minor changes, translations are from *The Complete Works of Aristotle: The Revised Oxford Translation*, ed. J. Barnes (Princeton, 1984); D. W. Hamlyn, *Aristotle's De Anima, Books I and II [Anima]* (Oxford, 1968); and C. J. F. Williams (trans. and comm.), *Aristotle's De Generatione et Corruptione* (Oxford, 1982).

guished. Many have introduced, on Aristotle's behalf, a candidate for matter that, unlike an organic body, satisfies the CS requirement. On this account, what is present and persists as matter in a living composite is some 'structured physical thing' whose criterion of identity is not essentially tied to the form or the 'life-constitutive' functions of the composite.⁵ This structured thing has on different occasions been called the BODY, remote matter, compositional flesh, and the non-organic body (which we shall use from now on), to name a few.⁶ It is not an anachronistic amendment, they claim. For Aristotle has the resources to articulate the notion, and in fact does so in his physical and biological works. The task, then, for these commentators is to provide a more detailed account of the non-organic body and to explain the relation between this body and the essentially ensouled body that falls under the domain of the homonymy principle. Such an account, in its strongest form, will allow one to say that 'non-organic bodies exist before and survive the death of the organism. Just as the iron of an axe co-exists with axe matter, so the non-organic body exists while organic bodies exist.'⁷ Let us call this interpretation the two-body thesis.

The ultimate aim of this essay is to undermine the attribution of the two-body thesis to Aristotle. Aristotle cannot take the matter of a living composite to be a second body that is actually present but not essentially ensouled. That no such body can play the role of matter is, it will be argued, a consequence of conditions that must be in place for an organic composite to be natural and for a natural body to be in *energeia*, that is, to be *actively*. This absence is not a failure; it is not a defect of Aristotle's account that living composites do not satisfy an artefact-oriented CS requirement. That insight can be obtained by jettisoning artefacts from their traditional position

⁵ The phrase 'structured physical thing' occurs in B. Williams, 'Hylomorphism', *OSAP* 4 (1986), 189–99 at 193. The term 'physical' here cannot be Aristotle's, viz. *φυσικός*, since for Aristotle the psychological activities of humans are just as physical as the movements of inorganic bodies. One of the tasks of those who introduce bodies characterized in this way is the justification of this distinct use. Cf. A. Code and J. Moravcsik, 'Explaining Various Forms of Living', in M. C. Nussbaum and A. O. Rorty (eds.), *Essays on Aristotle's De Anima [Essays]* (Oxford, 1992), 129–45 at 130.

⁶ The terms occur at S. M. Cohen, 'Hylomorphism and Functionalism' ['Hylomorphism'], in Nussbaum and Rorty (eds.), *Essays*, 57–73 at 69; T. Irwin, *Aristotle's First Principles [Principles]* (Oxford, 1988), 241; J. Whiting, 'Living Bodies' ['Living'], in Nussbaum and Rorty (eds.), *Essays*, 75–92 at 79; and C. Shields, *Order in Multiplicity [Order]* (Oxford, 1999), 137 respectively.

⁷ Shields, *Order*, 152.

as the paradigm exemplars of Aristotelian change will, it is hoped, be demonstrated through the discussion that follows.⁸

2. Function and homonymy

Given the centrality of the homonymy principle in the above reasoning, we must re-evaluate one feature of this discussion that commentators almost universally accept before embarking on the positive project: namely, that the application of the homonymy principle to an object is ultimately a consequence of the object requiring a functional characterization. The following passages, by no means the only ones, reveal the tendency to relate homonymy and function when it comes to organs:

[The body] has organs which are defined by their functions, and therefore . . . it cannot exist in the absence of soul, without which these organs could not perform their functions.

Hands, feet, etc., . . . exist only when they fulfil their function: when the organism has perished these material parts are replaced by mere homonyms.

A dead hand . . . has lost its identity as a hand because that identity depends on a set of functions which it can no longer perform.⁹

This connection is understandable: whenever the homonymy principle is invoked, considerations of function are in close proximity. But *ergon* is not, for Aristotle, a single concept.¹⁰ The way in which an organ has a function differs from the way in which an artefact has a function. Indeed, the simple bodies, inorganic bodies like copper and silver, and living composites—not just the organic body but *man*—are all said to have a function (*Meteor.* 4. 12) in a manner that differs from both organs and artefacts. In this section I shall

⁸ Though the conclusions of this paper will bear on the debate over Aristotle's adherence to functionalism, this complicated issue will not be directly discussed.

⁹ The quotes are from Whiting, 'Living', 77; Irwin, *Principles*, 241; and M. L. Gill, 'Aristotle on Matters of Life and Death', *Proceedings of the Boston Area Colloquium in Ancient Philosophy*, 4 (1989), 187–205 at 199–200, respectively.

¹⁰ Though *ἔργον* is commonly translated as 'function', one should keep in mind its relation to the adjective *ἐνεργός*, which means 'at work, working, active, busy', and its relation to the noun *ἐνέργεια*, which, interestingly, can be translated either as 'actuality' or as 'activity'. One should also note that Aristotle sees a deep connection between *ἔργον* and *ἐντελέχεια*—'fulfilment' or 'completeness' (*Metaph.* Θ 1, 1035^b34). With these reservations in mind, I shall continue using 'function', noting the importance of these connotations when necessary.

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argue that the fundamental functional notion for Aristotle is that of a natural unitary function; the functions of organs, artefacts, and parts of artefacts are derivative. Once these distinctions are made, we can see the extent to which functional characterization justifies applications of the homonymy principle.

(a) The varieties of function

There are two orthogonal divisions among the bodies to which Aristotle attributes functions. There are the functions of parts and the functions of unities. There are also natural and artificial functions. Four classes of objects result—artefacts (unitary, artificial), parts of artefacts (part, artificial), natural unities (unitary, natural), and organs (part, natural):

	NATURAL	ARTIFICIAL
PART	heart, eye, flesh (?)	door, haft, blade
UNITY	man, silver, fire	house, axe

To attribute a function to an object is to attribute a capacity (*dunamis*) to display some character or perform some activity in a way that makes the end (*telos*) of the capacity explicit. In so far as an object succeeds in exercising such capacities, it will, to that extent, perform its function. There is a canonical method for making such attributions with respect to organs or parts. Minimally, a character or activity *A* is the function of an organ if and only if (a) *A* has the organ as its subject, (b) *A* is a consequence of the organ's being there, and (c) the organ came to be for the sake of displaying or doing *A*. The third clause allows one to distinguish accidental activities, e.g. the heart's making a thumping noise, from things that are more clearly candidates for being the function of an organ, e.g. the heart's pumping blood. Current accounts, focusing on biological cases, develop this condition by requiring that the character or activity be naturally selected for or confer some survival-enhancing propensity on the organism.¹¹ Of course, such elucidations are not germane to an Aristotelian framework.

Allan Gotthelf has proposed an analysis of this clause that an

¹¹ Cf. L. Wright, 'Functions', *Philosophical Review*, 82/2 (1973), 139–68, and J. Bigelow and R. Pargetter, 'Functions', *Journal of Philosophy*, 84 (1987), 181–96, respectively.

Aristotelian can countenance.¹² An organ comes to be for the sake of doing *A* if and only if the generation of the organ is part of the exercise of a capacity that is irreducibly a capacity to become an individual with a form that requires an organ that does *A*. All changes, according to Aristotle, are exercises of some capacity or ability (in Gotthelf's terminology, an actualization of some potential), and these changes, according to Gotthelf, can be divided into two fundamentally different kinds: those that can be explained by citing only the exercises of the capacities of the simple bodies (earth, water, air, and fire), and those that cannot (presumably because the processes are so complex) and are, thereby, irreducibly exercises of capacities for the exemplification of a form. Organic development is among the latter and organs come to be because they (or something analogous) *must* come to be in order for an exemplar of some organic form to come to be entirely—that is, for the capacity that is irreducibly for an individual of that form to be entirely exercised.¹³ This 'must' exploits some character or activity of the organ, and this character or activity is the organ's function.¹⁴

Though I disagree with some of Gotthelf's analysis,¹⁵ the fun-

¹² In A. Gotthelf, 'Aristotle's Conception of Final Causality' and 'Postscript 1986' ['Final'], in A. Gotthelf and J. Lennox (eds.), *Philosophical Issues in Aristotle's Biology* (Cambridge, 1986), 204–42, esp. postscript III.

¹³ The qualifier 'entirely' is meant to eliminate the positing of a natural good not reducible to a specification of form. An organism can often exist without the presence of some organs determined to be necessary in this way. For example, our gut is convoluted because this delays excretion (*PA* 4. 1, 675^a19–^b23). We can come to be, i.e. exist, without this, but we cannot flourish—we would have to replenish ourselves much more often, limiting the leisure time needed to exercise our more refined capacities. But if flourishing is complete exemplification of one's form, then we do need a convoluted gut (or something analogous) to come to be *entirely*. Exemplification of form is more than satisfaction of the minimal conditions for existence.

¹⁴ In some cases the organ must be present because it is included in the essence/definition of the organism. In other cases, the 'must' is one of hypothetical necessity. For a discussion of the distinction see *GA* 5. 1, 778^b16–17, and J. Cooper, 'Hypothetical Necessity' ['Necessity'], in A. Gotthelf (ed.), *Aristotle on Nature and Living Things* (Pittsburgh, 1986), 151–67, repr. in J. Cooper, *Knowledge, Nature, and the Good* (Princeton, 2001), 130–47 at 131–2.

¹⁵ For example, I do not think Aristotle requires a dual account of *δύναμις*. If a simple body, say some small parcel of fire, in order to come to be in accordance with its nature, required (essentially or by hypothetical necessity) a more complex structure, the identity of its parts and the determination of the parts' functions would depend on the nature of the simple body in the same way that organs depend for their identity and function on the form of the organism. The capacities of all natural bodies are on a par; they are all, in a broad sense, capacities for a form. That this is so is one of the argumentative burdens of this essay.

damental insight of this approach—the feature that it shares with current accounts—is important. The determination of an organ’s function depends on the role the organ’s coming to be serves in the coming to be of the organism to which it belongs.¹⁶ The capacity whose exercise constitutes proper functioning for an organ is a capacity whose existence is explained by the role it plays in the development of a unitary organism, where the latter development is itself an exercise of a capacity whose end is the exemplification of a form.

This account of how the function of an organ or part is determined requires that there be objects with functions that are not themselves organs or parts. Let us call the functions of these wholes unitary functions. For example, the terrestrial simple bodies, inorganic metals, and organic composites all have functions (*Meteor.* 4. 12). As with organs and parts, to attribute a function to a unity is to attribute a capacity (*dunamis*) in a way that makes the end of the capacity explicit. The function of a parcel of fire, for example, is, in part, its characteristic movement towards the upper region and the ceasing of that movement upon reaching the upper region.¹⁷ The principle that underlies this characteristic movement is a particular capacity/ability, the complete exercise of which, for fire, is rest at its natural place. Though environmental constraints or success in reaching the upper region may occasion the end of this characteristic locomotion, the simple body, in such cases, does not cease to be fire. It still possesses the ability to move towards its natural place of rest; it still has the same natural unitary function. So objects characterized by their natural functions ‘are what they are in virtue of a certain capacity of action or passion’ (*Meteor.* 4. 12, 390^a18).

But a simple body does not come to be and does not possess the capacities it does because of the development or structure of an encompassing system. This is not to say that fire’s upward locomotive tendency or any other of its characteristic movements are caused or explained by an internal efficient principle. Indeed, inanimate bodies are not self-movers; their natural locomotive movements

¹⁶ Cf. *PA* 1. 1, 640^a33–^b4, and *Metaph.* Z 10, 1035^b10–20.

¹⁷ Pace Gill, ‘Aristotle on Matters of Life and Death’, and S. M. Cohen, *Aristotle on Nature and Incomplete Substance* (Cambridge, 1996), I accept the traditional reading that the terrestrial simple bodies possess natures that comprise a principle of movement *and* rest. See sect. 2 of I. Bodnár, ‘Movers and Elemental Motions in Aristotle’, *OSAP* 15 (1997), 81–117, for a persuasive argument against alternative interpretations.

are initiated by and require the activity of external bodies.¹⁸ But to explain the function of a natural body one need not appeal to the form of any external body. As Aristotle says, ‘to ask why fire moves upward and earth downward is the same as to ask why the healable, when moved and changed *qua* healable, attains health and not whiteness’ (*De caelo* 4. 3, 310^b16–19). The explanation of natural unitary functions need not involve reference to any distinct form or nature. In contrast, as we have seen, the explanation and attribution of part functions require a reference to the form of the whole of which the body is a part, the *that for the sake of which*.

The discussion to this point has focused on examples that are natural. But much of what has been said so far is applicable, with small modifications, to artefacts. What is the function of a door? A door comes to be for the sake of entry to and egress from the home of which it is a part. Doors are made and are made to have the function that they have because they, or something analogous, are (hypothetically) necessary for a home to come to be. In addition, artefacts do not possess their functions because they are parts of a larger system; artefacts are functional unities. One need not appeal to anything beyond the form of an artefact in order to explain its characteristic activities. Houses shelter and axes chop in normal circumstances *because* they are houses and axes.¹⁹ If the function of an artefact with form *F* is to ϕ , then an explanation of why the artefact ϕ 's that goes beyond citing that the artefact exemplifies *F* seems out of place.

There remain, however, important differences between natural unitary functions and artificial unitary functions. The ground for such differences will not be fully described until Section 5(a), but a preliminary explanation of the primacy of natural unitary functions can be provided. One sense of primacy is ontological. The coming to be of a natural body is the outcome of the functioning of other natural bodies: either of individuals of like kind in the case of organic bodies, or of individuals of different but cyclically related kinds in the case of the simple bodies.²⁰ The forms corresponding to these natural bodies are eternal (*ἀίδιος*) and collectively contain the principles required for production of new individuals with those

¹⁸ *Phys.* 8. 2, 252^b21–3; *Phys.* 8. 4, 255^a10–15, 255^b29–31; *MA* 1. 6, 700^b6.

¹⁹ Cf. W. Charlton, *Aristotle's Physics I–II* (Oxford, 1970), 89.

²⁰ Cf. *GA* 2. 1, 731^b21 ff.; *DA* 2. 4, 415^a22–^b8; *Metaph. Z* 7, 1032^a22–7; and *GC* 2. 4, respectively.

forms. On the other hand, the coming to be of an artefact is the coming to be of an individual with a form that occurs in the soul of an artificer. Without the coming to be of natural bodies and the subsequent exercise of their natural unitary functions there would be no artefacts. A second sense of functional primacy follows from this ontological dependence. An artefact fulfils its function only in so far as the activity contributes, in part, to the flourishing of another individual.²¹ A natural unitary function is that character or ability the display or exercise of which constitutes a stage in the development or flourishing of the very same object. When fire moves to the upper region, it is the fire that flourishes. When a man develops into a perfect exemplar of his form, it is the man that flourishes. But the flourishing of an artefact is, *ipso facto*, the flourishing of the artificer. Artefacts are the by-products of the exemplification of the form of natural unities and depend, both ontologically and functionally, on those natural unities.²²

(b) *Natural unitary homonymy*

Though natural unitary functions are, for Aristotle, fundamental, it still might be the case that applications of the homonymy principle are not similarly prioritized. It is, as I have suggested, a goal of many commentators to apply a unitary account of matter and form to artefacts and natural organic composites. If applications of the homonymy principle can be explained by an account of function that is insensitive to the above distinctions, then such an assimilation gains support. This assimilation would favour a general hylomorphic account that satisfies the CS requirement, since there seems to be no impediment to countenancing both a functional and a non-functional level of matter for artefacts. Though one might, in certain circumstances, be inclined to say that it is doors and windows that are the matter of a house, at the most basic level the matter of the house is a collection of non-functionally specified objects—planks of wood, panes of glass, bricks, etc. Similarly, it will not be a natural body with functionally specified organs that is the matter of man. A non-organic body, however that is cashed out, will serve as matter for a living composite.²³ Three considerations,

²¹ Cf. n. 13 for this generalized use of 'flourishing'.

²² For an interesting development of similar considerations, see S. Kelsey, 'Aristotle's Definition of Nature', *OSAP* 25 (2003), 59–88.

²³ Cf. Shields, *Order*, 146 n. 34, in which the extension of homonymy to artefacts

however, suggest that homonymy attributions are sensitive to the primacy of natural unitary functions.

(i) *Local vs. terminal*. If an organ ceases to perform its function, this can be for two reasons. It can be a local malfunction, e.g. an eye of an otherwise healthy individual that can no longer see because of a deteriorative congenital condition or an injury. The non-functional organ stands at one extreme of a continuum of operative success. On the other hand, an organ may cease to function because the organism for the sake of which the organ came to be perishes. In such a case, the form that determines the identity of the organ and its function is no longer present. If the function of an organ is essentially for the sake of its contribution to the functioning of some encompassing organism, then the organ cannot play that role upon the death of that organism and thereby ceases to function.

This distinction mirrors one Aristotle finds in the notion of a lack (*sterēsis*):

Lack is said in many ways. For there is (1) that which simply does not possess, and (2) that which might naturally have it but has not got it, either (a) completely of that which might naturally have it but has not got it, or (b) when it is naturally suited to possess it, either in this way completely, or when in any degree it fails to have it. And in some cases, where things are naturally suited to possess, and fail to have it by force, we say they are lacking. (*Metaph.* Θ 1, 1046^a31–5)

Cases of local non-functioning arise when the lack occurs in that which should naturally have some function, but is no longer able to perform it, either partially or entirely, through internal defect or external violence. Terminal non-functioning is an instance of the first sort of lack; a severed hand does not naturally have the capacities that it lacks. The eye of a corpse does not have the ability to see in the same way that a rock does not have the ability to see.

Local non-functioning does not justify applications of the homonymy principle. An eye remains an eye if it is able to perform its function only half as well as it once did. And since the difference between fully functional organs, minimally functional organs, and non-functional organs is one of degree, an eye of an otherwise healthy individual will remain an eye even if it cannot perform its

is cited as a reason for accepting the two-body thesis (or at least for rejecting many arguments against it). Though the extension is made, the passage he cites as an example of this extension, viz. *DA* 2. 1, 412^b12–13, is, we shall see, poorly chosen.

function at all. Such organs retain their identities but are defective. Terminal non-functioning, however, does justify applications of the homonymy principle. There are numerous instances of the homonymy principle that explicitly cite the death of the whole to which the part or organ belongs. A 'dead man', 'the hand of a dead man' (*Meteor.* 4. 12, 389^b31-2), 'a corpse', 'the parts of a corpse' (*PA* 1. 1, 640^b34-641^a34), and 'the face or flesh without soul in it' (*GA* 2. 1, 734^b24-7) are the objects to which homonymy applies. Applications of the principle are also introduced with such phrases as 'if the whole body be destroyed' (*Pol.* 1. 2, 1253^a19-25), 'If the soul were removed' (*DA* 2. 1, 412^b12-13), and 'if severed from the whole' (*Metaph. Z* 10, 1035^b23-4). The only citations that may be instances of local organ deterioration are that of a 'dead eye' (*Meteor.* 4. 12, 390^a12) and a 'dead finger' (*Metaph. Z* 10, 1035^b25). But given Aristotle's overwhelming tendency to place his remarks in contexts of organismic death and not local organ deterioration, even these applications seem to have as their subjects the eye and finger of a dead man. So it is true that the homonymy principle is applied to organs when they can no longer function, but only in circumstances in which the whole has ceased to function. It is the presence or absence of a unitary function that determines whether homonymy is applicable to the parts of an organism.

(ii) *Unitary vs. part.* Another important class of homonymy attributions appeals to material inadequacies. Aristotle speaks of hands made of stone, wood, or bronze (*Pol.* 1. 2, 1253^a19-25; *PA* 1. 1, 640^b34-641^a34), eyes made of stone (*DA* 2. 1, 412^b21-3), and face and flesh made of stone or wood (*GA* 2. 1, 734^b24-7) as being those objects only homonymously. In the artefactual domain, similar things are said of stone flutes and wooden saws (*Meteor.* 4. 12, 390^a10-12).

Aristotle often argues that some organ or artefact must have a particular material constitution. Schematically, the arguments take one of the following two forms.²⁴ Either:

- (1) An object, *O*, has function *F* (or is for the sake of *F*ing).
- (2) In order for *O* to *F*, *O* must have the character/property/capacity *C*.

²⁴ Cf. J. Lennox, 'Material and Formal Natures in Aristotle's *De Partibus Animalium*', in id., *Aristotle's Philosophy of Biology* (Cambridge, 2001), 182-204 at 196-8, and Cooper, 'Necessity', 133.

- (3) The material *M* is the only (or one of few) material(s) available from which *O* can come to be that displays *C*.
- (4) So, *O* is made of *M* (or another material that displays *C*).²⁵

Or, as a continuation of the above reasoning:

- (5) In order for an *O* with character/property/capacity *C* to *F*, there must be another object, *O'*, with function *F'*.
- (6) Repeat (2–4) with *O'* and *F'*.²⁶

So the reason these objects cannot function as the organs they purport to be is because their material constitution cannot satisfy the demands that need to be satisfied in order for the whole to come to be and exercise its unitary function. Again, it is the function of the whole that has the primary explanatory role in the application of the homonymy principle.

(iii) *Natural vs. artificial*. Cases in which Aristotle directly applies the homonymy principle to artefacts, and even cases where he applies it to the functionally specified parts of living organisms, occur under the counterfactual hypothesis that the objects are not artefacts, or mere parts, but natural or living unities. Phrases such as ‘if an instrument, e.g. an axe, were a natural body . . .’ (*DA* 2. 1, 412^b12–13) or ‘if the eye were an animal . . .’ (*DA* 2. 1, 412^b21–3) commence the relevant passages. This suggests that the applicability of the homonymy principle is intimately connected to the status, as natural, of the applicans.

The counterfactual hypotheses are not idle claims. The discussions that follow treat them as important qualifiers. Consider the first argument:²⁷ Aristotle assumes:

- (1) An instrument, e.g. an axe, is a natural body.

On this assumption it follows that:

- (2) (a) Being an axe [its essence] would be (b) its substance, and (c) this would be its soul,

²⁵ For example, at *PA* 3. 3, 664^a36–^b3, Aristotle argues: (1) the larynx is for the sake of vocalizing; (2) in order for something to vocalize, it must be smooth and hard; (3) cartilage is smooth and hard; so (4) the larynx is made of cartilage.

²⁶ For example, at *PA* 2. 13, 657^a30–5, after arguing that eyes must be made of a material that is fluid in character, Aristotle argues: (1) in order for an eye with a fluid character to see, there must be another object, an eyelid, to protect it; (2) in order to protect the eye, the eyelid must be solid . . .

²⁷ *DA* 2. 1, 412^b12–16. This schema is James Allen’s.

and

- (3) (a) Were this [its soul] separated, (b) it would not still be an axe, except homonymously.

Aristotle then makes a correction:

- (4) But now it is an axe,

because

- (5) It is not of such a body [an artefact] that the essence and the *logos* are the soul, but of such a natural body, having a principle of change and remaining the same in itself.

This argument has been a source of interpretative debate. Some take (4) to be a response to 3(b)—it would still be an axe. The correction would then either be to 3(a)—the soul, essence, or substance is not separated, so it is still an axe—or 3(b)—despite the fact that the (would-be) soul, essence, or substance is separated, it is still an axe. I follow Hamlyn, *Anima*, 86 and Cohen, ‘Hylo-morphism’, 70, in reading the correction as a withdrawing of the counterfactual assumption—the axe is an artefact and not a natural body. This is the only way to understand Aristotle’s justification of the correction. The soul can be the *logos* only of a natural body, not an artefact. Hence the conclusion that follows on the assumption, namely, that the homonymy principle applies to the axe, does not follow. Such homonymy depends on the object having a nature.

None of this undermines the importance of part functions in these debates. But these considerations do suggest that the non-functioning of a part is not the explanandum of the homonymy principle; the identity of a part/organ, the determination of an organ’s function, and the applicability of the homonymy principle all have the same explanandum—the status of the unitary nature of a whole. It is for this reason that the homonymy principle and its connection to the functional characterization of organs/parts will not, as is traditionally the case, be the cynosure of the discussion that follows. What it takes for something to have a nature, what it is about natures that grounds functional explanations, and the relationship between natural unitary functions and applications of the homonymy principle will take centre stage. These questions will be resolved first with respect to two classes of natural objects that

are simpler than living bodies: the four simple terrestrial bodies—earth, water, air, and fire—and the homoeomerous bodies that result from the mixture of these. The lessons learnt from these investigations will then be brought to bear on living bodies. The resources needed to defeat the two-body thesis will be acquired *in ambulando*.

3. Inorganic unity

(a) *Simple bodies*

In order to clarify the relations between natures, functions, and homonymy with respect to our first example of natural unities, the simple bodies, we must highlight three features of Aristotle's account. The first thing to note is the familiar observation, though not always expressed in this terminology, that the simple bodies lack principles of individuation but have criteria of identity. Aristotle justifies these claims respectively by arguing that the simple bodies are not substances but are natural homoeomers.

It is sensible to ask if something before you is a parcel of earth and it is possible to distinguish a parcel of earth from a parcel of water. It does not make sense, however, to ask if the earth before you is one or many. 'Earth', 'water', and the like are not count nouns. Their semantic character is more like that of a mass noun. These linguistic observations reflect (meta)physical characteristics of the simple bodies and these characteristics explain why the simple bodies are not to be counted among proper substances. Aristotle says of the simple bodies that 'none of them is one, but they are like a heap before it is fused by heat and some one thing is made out of the bits' (*Metaph. Z* 16, 1040^b8–9). This is not to say that, like a heap of sand, a parcel of earth comprises numerous propinquous individual unities. For 'there is a lot of water, not many waters' (*Metaph. I* 6, 1056^b16). Rather, the analogy highlights that, like a heap, a parcel of earth *qua* earth is not *one thing*. To treat the simple bodies as countable unities is to impose on them an accidental unity (and a corresponding principle of individuation) that goes beyond any unity provided by the identity of the simple bodies as such.

That the simple bodies do have criteria of identity is clear from their having the status of homoeomers. A homoeomer is something 'such that we can apply the same name in the same sense to a part of

it as to the whole' (*GC* 1. 1, 314^a19–20). It is odd to speak of simple bodies as having parts, as 'part' is itself a count noun. If presented with a parcel of water, one cannot say how many parts it has until one has specified a principle of individuation to be conveyed by 'part'. Still, in so far as a parcel is divisible, it is sensible to say that no quantity of that parcel, once separated off, would cease to be water. So when Aristotle says that 'a part of water is water' (*GC* 1. 10, 328^a10), he is claiming that any quantity of a simple body is divisible indefinitely into parcels that have the same *identity* as each other, namely, the identity of the whole from which they are separated.

Now in what does this identity consist? A clue is provided in a discussion of another homoeomer—gold. Aristotle, when talking about 'pieces of gold separated from one another', asserts that their 'nature is one' and clarifies this by saying that 'each piece must, as we assert, have the same motion' (*De caelo* 1. 7, 275^b33–276^a1). Aristotle continues and extends the claim to the simple bodies saying 'a single clod moves to the same place as the whole mass of earth, and a spark to the same place as the whole mass of fire' (*De caelo* 1. 7, 276^a15). Thus, for a simple body to have an identity is for it to have a unitary nature.²⁸ And since 'a source of movement within the thing itself is its nature' (*De caelo* 3. 2, 301^b17), the identity of the simple bodies is exhausted by this internal principle of movement (cf. *De caelo* 1. 3, 270^a4–6). A simple body is not *one* nature, but it is one *in* nature (cf. *Metaph. I* 1, 1052^a20).

The second feature of Aristotle's account that is important for our purposes is his more detailed analysis of these principles of movement. Strictly speaking, the simple bodies are not elements (*stoicheia*). Indeed, Aristotle contrasts his view with sundry Pre-socratic views that take the simple bodies to be elements (*GC* 2. 3, 330^b7). The simple bodies are simple *qua* bodies; that is, they are the simplest material components of any composite body. But neither fire nor air nor any of those we have mentioned is in fact simple but mixed (*GC* 2. 3, 330^b22).²⁹

In *De generatione et corruptione* Aristotle focuses on two pairs

²⁸ Cf. 'the continuous by nature are more one than the continuous by art. A thing is called continuous which has by its own nature one [natural] movement and cannot have any other; and the movement is one when it is indivisible' (*Metaph. Z* 5, 1015^b36).

²⁹ Cf. *GC* 1. 6, 322^b1–2, 328^b31, 329^a16, 329^a26; *PA* 2. 1, 646^a13 for descriptions of the simple bodies as *apparent* or *so-called* simple bodies.

of contrary elements (*stoicheia*) from which the simple bodies are mixed: the hot and the cold, and the wet and the dry. Most commentators speak paronymously of the elements by predicating their adjectival forms to the simple bodies. James Bogen, for example, takes the elements to be abilities or powers *possessed* by the simple bodies.³⁰ Something is hot if it can aggregate like things, cold if it can aggregate all things regardless of similarity. Something is wet if it is not internally bounded but is easily bounded externally, dry if it is internally bounded but not easily bounded externally (*GC* 2. 2, 329^b26–33). The simple bodies possess these abilities to the maximal degree. Alternatively, Mary Louise Gill takes the elements to be properties or differentiating features that the simple bodies possess essentially.³¹ By assuming that the elements are metaphysically predicative, one can then appeal to Aristotle's account of contraries, which is worked out with predicates, to draw conclusions about the simple bodies. To say that two things are contrary to one another is to say that they are the extremes of a continuous spectrum each intermediate position of which represents a non-incidental change for objects of which the extremes can be predicated though not simultaneously. So while there may be six combinatorial possibilities for the elementary abilities/properties, the impossibility of there being a single metaphysical subject that simultaneously possesses contrary abilities/properties leaves us with only four pairings. The four simple terrestrial bodies are each associated with one of the possible pairings of extrema. Fire is hot and dry, air is hot and wet, water is cold and wet, and earth is cold and dry (*GC* 2. 3, 330^b1–4).

These predicative accounts, however, leave an important aspect of Aristotle's discussion unexplained. The elements must occur in complementary pairs, or 'yokings'. Nothing can be hot or cold without also being wet or dry and vice versa.³² If the elements are merely

³⁰ J. Bogen, 'Fire in the Belly', *Pacific Philosophical Quarterly*, 76/3–4 (1995), 370–405.

³¹ M. L. Gill, *Aristotle on Substance [Substance]* (Princeton, 1989).

³² Commentators who reify the elements seem to be at a loss to explain the phenomenon as well. For example, Furth simply claims that 'it is of the nature of the contraries to form pairwise "linkages"' (M. Furth, *Substance, Form, and Psyche* (Cambridge, 1988), 233). Some take the relation between the paired elements to be that of hylomorphic composition—the wet/dry is the matter and the hot/cold is the form. But in the transformation of air into water, it is the wet that serves as matter; in the transformation of water to earth, it is the wet that serves as form. There is nothing in the hylomorphic account that would prevent, in principle, a simple body that is wet/wet.

predicable abilities or properties, why can they not be possessed in isolation as *white* and *musical* can? The resources available to Bogen and Gill, namely, that the abilities/properties are possessed maximally or essentially, apply individualistically to the elements and provide no ground for drawing connections between elements.³³

The inability to explain the relation between the two pairs of contraries stems from thinking of them combinatorially: that is, from thinking of a simple body as a combination or conjunction of two metaphysically independent, but somehow complementary, elements. But the simple bodies are not constructed from below, as it were, out of independently determinable elements. One must instead take the complementation to be fundamental. One way to do this is to emphasize an important way in which Aristotle characterizes the elements. Aristotle says that the elements are principles (*archai*) of the simple bodies. Specifically, the two pairs of contraries, hot/cold and wet/dry, are said to be, respectively, the active and passive principles of change for the simple bodies.³⁴ Thus, the pair of elements *is* the nature of a simple body. And a nature is unitary, not a combination or conjunction of disparate principles.³⁵ Thus to say that a parcel of fire and a parcel of air share a feature, namely, the hot, is to say that the nature of the parcel of fire and the nature of the parcel of air manifest themselves similarly with respect to their active changes. When a parcel of fire is transformed into a parcel of air, the hot can serve as that which remains throughout the change so as to avoid Parmenidean worries of generation *ex nihilo* and destruction *in nihilum*; but for the hot to persist is not for there to be some autonomously identifiable element that at one time is paired with the dry and at a later time paired with the wet. It is, rather, for a unitary nature, hot/dry, to become a distinct unitary nature, hot/wet. Since it is natures that determine the identities of the simple bodies, having natures that are principles for simi-

³³ To be fair, Gill argues that 'actual tangibility demands features of both sorts (temperature and humidity)' (*Substance*, 81). Though tangibility and elemental pairing may be coextensive, I cannot find in the text a direct argument from tangibility to the pairing of elemental contraries, and Gill provides no citations for any such argument. I suspect that the tangibility of the simple bodies has the same explanandum as the elemental yokings and is not itself the explanandum.

³⁴ *GC* 2. 1, 329^b24–6; *Metaph.* *I* 6, 378^b10–25.

³⁵ On my reading, the notion of a body having only a principle of rest or a principle of motion is nonsensical. They are two sides of one nature, with rest being the privation of motion (*Phys.* 8. 1, 251^a27). Cf. above, n. 17.

lar movements makes elemental transformation possible without having to reify a unitary substratum (*hupokeimenon*).

The final feature of simple bodies that concerns us is the way in which they are subject to claims of homonymy. That homonymy is applied, by Aristotle, to the simple bodies is clear. For water and fire 'are not water and fire in any and every condition of itself' (*Meteor.* 4. 12, 390^a7–9) and Aristotle considers what would follow 'if those elements are named homonymously' (*De caelo* 1. 8, 276^a30 ff.).

There are two cases of homonymy of interest with respect to the simple bodies. The first is somewhat mundane. Much of what we point to and say 'that's fire' or 'that's some earth' is not, strictly speaking, *pure* fire or earth. They are aggregates of all sorts of different simple bodies and homoeomerous mixtures.³⁶ These aggregates often have the same appearance (*schēma*) as a parcel of isolated earth, air, water, or fire, but do not have a single identity, let alone one corresponding to the simple bodies in isolation.

The second case of homonymy requires that we further expand Aristotle's account of the simple bodies. I shall call the two pairs of elements, hot/cold and wet/dry, the primary, interactive, tangible contraries. They are primary because the other interactive, tangible contraries, e.g. viscous and brittle, hard and soft, etc., supervene on this pair (*GC* 2. 2, 329^b32). They are interactive because they are said of things in virtue of those things affecting and being affected by other bodies (*GC* 2. 2, 329^b20–4). And they are tangible because they are 'distinctive qualities of body, *qua* body' (*DA* 2. 11, 423^b27–8). Aristotle focuses on interactive, tangible contraries in *De generatione et corruptione* because he is trying to explain, in that work, the processes of generation, corruption, growth, and mixture. A necessary condition for such processes is that the relata be in reciprocal contact with one another. Two bodies or magnitudes are in contact when 'they have their extremes together and are capable of moving, or of being moved by, one another' (*GC* 1. 6, 323^a11). So the only capacities that one need appeal to in this context are those that are exercised when one body comes into contact with another and, in so doing, effects a change—the interactive, tangible contraries.

But this does not mean that a specification of the hot/cold and the wet/dry exhausts the nature of the simple bodies. There are the

³⁶ Indeed, there is some indication that Aristotle thinks that no bodies encountered in the sublunary sphere are simple (*GC* 2. 8).

powers of these bodies to affect senses other than touch, say whiteness and blackness. But, given that the processes of generation, corruption, growth, and mixture can be explained by appealing solely to the tangible characteristics of the simple bodies, these features can be neglected as differentiae ‘even if in fact [they are] prior by nature’ (*GC* 2. 2, 329^b6–16). There is, however, an important *tangible* contrary that is not reducible to the two primary, interactive, tangible element pairs, namely, the heavy and the light. The heavy and the light are ‘not said of things in virtue of their acting upon something else or being acted upon by something else’ (*GC* 2. 2, 329^b20). That is, the heavy and the light are not reducible to and do not supervene on the primary, interactive, tangible contraries.³⁷ I shall call the heavy and the light the *non*-interactive, tangible contraries.

Attributions of heaviness or lightness to a body are attributions of a principle of natural locomotion. For Aristotle tells us to ‘apply the term “heavy” to that which naturally moves towards the centre, and “light” to that which moves naturally away from the centre’ (*De caelo* 1. 3, 269^b22–4).³⁸ These principles of natural locomotion contribute to the natures of the simple bodies that manifest them.³⁹ And the locomotive aspect of a simple body’s nature cannot be neglected when it comes to determination of identity, for ‘one sort of movement is appropriate to each simple body, and we should be

³⁷ The following passage might lead one to think that the heavy and the light are so-reducible: ‘perhaps it is better to speak of composition from the elementary capacities [*δυνάμειων*]; nor indeed out of all of these . . . For wet and dry, hot and cold form the material of all composite bodies; and all other differences are secondary to these, such differences, that is, as heaviness or lightness, density or rarity, roughness or smoothness, and any other such properties of bodies as there may be’ (*PA* 2. 1, 646^a14–20). This passage, however, is explaining the coming to be, *within animals*, of relatively complex structures, e.g. tissues and organs, from the simple bodies. This process need not appeal to the heaviness or lightness of the simple bodies. In general, the principles of natural locomotion that attributions of heaviness and lightness convey are often needed to bring parcels of simple bodies in contact with one another so that processes such as mixing and growth, which require the operation of the primary, interactive, tangible contraries, can occur. But the locomotion present in embryological development is caused by the principle of movement present in the semen of the male progenitor and is not reducible to the locomotive principles of the simple bodies that serve as matter. It is in this sense that wet/dry and hot/cold are the only contraries that ‘compose’ the more complex structures. Cf. sect. 4(b) for a more complete discussion of this.

³⁸ Cf. *Phys.* 8. 4, 255^b15–16; *De caelo* 4. 1.

³⁹ ‘. . . the movement of each body to its own place is motion towards its own form’ (*De caelo* 4. 3, 310^a35).

compelled to identify it with one of the bodies which move in this way' (*De caelo* 1. 3, 369^b31–5).⁴⁰

Homonymy can arise when the interactive tangible powers and the non-interactive tangible powers do not complement one another. This is clear in the following passage from *De caelo* in which Aristotle is contemplating 'whether there is any obstacle to there being other worlds [κόσμος] composed on the pattern of our own' (*De caelo* 1. 7, 274^a26–8):

Further, these worlds, being similar in nature to ours, must all be composed of the same bodies as it. Moreover, each of the bodies, fire, I mean, and earth and their intermediates, must have the same capacities [δύναμιν] as in our world. For if those elements are named homonymously and not in virtue of having the same form as ours, then the whole to which they belong can only be called a world homonymously. Clearly, then, one of the bodies will move naturally away from the centre and another towards the centre, since fire must be identical with fire, earth with earth, and so on, as the fragments of each are identical in this world . . . therefore, since the movements are the same, the elements must also be the same everywhere. The particles of earth, then, in another world move naturally also to our centre and its fire to our circumference. (*De caelo* 1. 8, 276^a30–^b14)⁴¹

If the simple bodies in this other world seem to move in the manner that the simple bodies in this world move, that is, if the foreign 'earth' moves to *its* centre and the foreign 'fire' moves to *its* periphery, then these foreign bodies will not be identical in nature to our simple bodies. For Aristotle, locations of natural rest determine the principles of locomotion for sublunary bodies, and these locations are not specified relative to a world but have absolute significance. So even if the foreign bodies interact with one another in a way that is identical to the manner in which our simple bodies interact, the classifications based on these principles of interaction alone will be homonymous.⁴²

In sum: (1) For the simple bodies, natures determine identity.

⁴⁰ In a discussion clearly focused on locomotion, Aristotle says that 'the distinction of the elements depends upon the distinction of the movements' (*De caelo* 1. 8, 276^b9).

⁴¹ The argument is a *reductio* of the claim that there is more than one world. So the homonymy that depends on this claim will never actually occur. Still, the argument shows the conceptual possibility of such homonymy. But compare: 'If one were to remove the earth to where the moon now is, the various fragments of earth would each move not towards it but to the place in which it now is' (*De caelo* 4. 3, 310^b2–5).

⁴² Indeed, if an Aristotelian physicist were unknowingly taken from our world and placed this other world and if the interactions and local movements of the foreign

(2) The identity/nature of a simple body is unitary. (3) This unitary nature is the principle of the characteristic interactive and non-interactive tangible contraries. (4) When the ends of these activities are made explicit, one has specified the natural unitary function of a simple body. (5) The homonymy principle is applicable to those bodies that are structurally/qualitatively similar but do not have the same nature.

These conclusions will serve as the core of a general account of natural unity. Once the (similar) account of mixtures is appended, we shall be in a position to assess the most complicated of natural bodies, the organic.

(b) *Mixtures*

The process of mixing (*mixis*) is *sui generis* among changes. It is neither a substantial change, nor one of the standard cases of movement (*kinēsis*): growth, alteration, or locomotion. That this is so is brought out by a tripartite *aporia* (*GC* 1. 10). It seems as if one of the following must occur in mixing:

- (a) The ingredients of the mixture remain unchanged.
- (b) One of the ingredients perishes while the other remains the same.
- (c) Both ingredients perish.

If (a) is correct, then there is no mixture; what results is just an aggregate (*sunthesis*) of simple bodies, like barley and wheat shaken up in a bag. If (b) is correct, then there is no mixture; what results is the growth of one of the ingredients through the destruction of the other. If (c) is correct, there is no mixture; what results does not contain any of the prior ingredients, a paradigm case of generation and destruction. So the *aporia* demands of mixing that it (1) be different from generation and corruption—all the ingredients must be present in the product and must retain their identities—and (2) be different from aggregation—the product of mixing is homoeomerous and does not comprise distinct parcels of ingredients.

Aristotle's solution, in broad outline, is that 'it is possible for things after they have been mixed to be and not to be. Some other thing which comes to be from them is actually [*ἐνεργεία*], while

bodies seem to be identical to her home bodies, then there would be no reason for her to not use the names of the simple bodies homonymously.

each of the things which were, before they were mixed, still is, but potentially [*δυνάμει*], and has not been destroyed' (*GC* 1. 10, 327^b23–6). A complete analysis of this account would take us far afield, but a brief investigation will reveal many similarities between this account and that given of the simple bodies.⁴³

Mixing differs from the generation of one simple body from another. In the latter transformations, one of the simple bodies occurs in greater quantity than the other.⁴⁴ This difference in quantity leads to the dominant body overpowering the smaller body and completely assimilating it. The other body does not have potential existence, or existence in capacity, in the product; it has been destroyed.⁴⁵ So one necessary condition for mixing to occur is that there be a balance of power between the two interacting bodies. When 'the two are more or less equal in strength, then each changes from its own nature in the direction of the dominant one, though it does not become the other but something in between and common to both' (*GC* 1. 10, 328^a28–9). In mixture there is a mutual modification, whereas in generation the modification has a single direction.

The change that occurs when commensurate bodies interact is a mollification of excesses:

When one [of the contraries hot or cold] exists *simpliciter* in actuality [*ἐντελεχείᾳ*], the other exists in potentiality [*δυνάμει*]; when, however, it is not completely so, but as it were hot-cold or cold-hot, because in being mixed things destroy each other's excesses, then what will exist neither their matter nor either of the contraries existing *simpliciter* in actuality [*ἐντελεχείᾳ*], but something intermediate. (*GC* 2. 7, 334^b9–14)

So the mixture that results is neither, say, hot nor cold. It manifests one of the intermediate positions on that continuous spectrum of change.

⁴³ For a thorough discussion of mixing see K. Fine, 'The Problem of Mixture', *Pacific Philosophical Quarterly*, 76/3–4 (1995), 266–369. I disagree with important features of his analysis, e.g. his dependence on prime matter and his insistence that the *bodies* of the ingredients must be present in the mixture, but a detailed comparison of the views is beyond the scope of this essay.

⁴⁴ For when many of them are juxtaposed to few or large ones to small, then indeed they do not give rise to mixing, but to growth on the part of that which is dominant (*GC* 1. 10, 328^a23–6).

⁴⁵ Instead of potential existence I shall often speak of existence in capacity. In sect. 4(b) this notion, and the corresponding notion of being in *energeia*, will be thoroughly discussed.

But why is this not just an example of (*c*), a process in which two simple bodies are destroyed and a third body is generated? Since it is natures that ground all claims of identity for the simple bodies, these natures must persist in the mixture for the simple bodies to exist. But they must be present in a way that differs from their unfettered manifestation in isolation or they will completely exist in actuality.

This balancing might occur if both simple bodies continue to manifest their natures but do so simultaneously and antagonistically so as to cancel out each other's effects. But this suggests that a mixture results from the mere compresence of the natures of the ingredients, say hot/dry fire and cold/dry earth resulting in a mixture that is (hot/dry + cold/dry). In such a situation, the ingredients would actually exist compresently, an impossibility for Aristotle (e.g. *Phys.* 8. 1, 209^a6). Moreover, the resultant mixture actually exists and is homoeomerous. This requires that the mixture have a unitary nature.

Rather, a mixture is *composed* of its ingredients.⁴⁶ This composition results in a unitary nature that is produced by but is not eliminable in favour of the natures of the ingredients. To understand this relationship, it is helpful to note that it holds not just among the simple bodies, but is also manifest, Aristotle claims, in explaining colours. Bodies of many different colours are produced through the composition of black bodies and white bodies according to principles analogous to those active in the mixing of simple bodies (*De sensu* 3, 440^a31–^b23). The relationship is not one of juxtaposition or superimposed compresence as suggested in the previous paragraph, but is rather a 'complete fusion'. The product, say a red body, depends both aetiologically and ontologically on black and white bodies. But it is homoeomerous with respect to colour and this colour is the manifestation of a single capacity. Red is a colour *sui generis* but it is not a primitive colour.

The same relation must hold between simple bodies and mixtures. A mixture of fire and earth results in a unitary nature, namely (hot-cold/dry-dry). This is not a substantial change resulting in a new primitive nature, say warm/dry. If it were, the process would

⁴⁶ '... since contraries admit of an intermediate and in some cases have it, intermediates must be composed out of the contraries' (*Metaph.* I 7, 1057^a18). Cf. *Phys.* 1. 5, 188^b21–6.

be no different from generation or destruction. There must not only be an aetiological dependence but also an ontological dependence of the mixture's nature on the natures of the simple ingredients. Still, the natural activity of the resultant mixture is the result of a single unified capacity.⁴⁷

So, like the simple bodies, inorganic mixtures are not substances. But they are natural and in this nature consists their identity. Despite their aetiology, they are 'continuous by nature', and this unitary nature is the principle of a mixture's characteristic interactive and non-interactive tangible contraries. When the ends of these contraries are made explicit, one has specified the natural unitary function of a mixture.

4. Organic unity

It is now time to apply these insights to the case that is most important for our purposes, namely, that of organic bodies. I have laboured to explain the unity of inorganic bodies because I think they, rather than artefacts, are paradigms of the unity present in organic composites. An organic body, say a man, is 'continuous by nature'. An immediate difficulty arises on this view. Organic composites and the organs they comprise, unlike the simple bodies and mixtures, are anhomoeomerous—no proper part of man or a hand is itself a man or a hand. This fact engenders a difficult *aporia*, the discussion of which will allow us to develop this hypothesis and provide us with the resources to defeat the two-body thesis.

⁴⁷ More will be said about being in capacity in sect. 4(b). Even after that discussion, the result may not seem like much of an explanation. But to request more is to ignore that mixture is a process *sui generis*. Mixing cannot be explained in terms of generation or alteration, and to show that it exists would be another example of one having 'to prove what is obvious by what is not; the mark of a man who is unable to distinguish what is self-evident from what is not' (*Phys.* 2. 1, 193^a5–6). That mixing exists is evident because, Aristotle contends, we observe that homoeomerous bodies result from the interaction of simple ingredients according to an effective rule of composition. Mixing allows one to countenance this phenomenon without having to posit an infinite number of primitive natures. Just as Aristotle must show that change is possible when confronted by Parmenidean arguments to the contrary but need not show that change occurs, Aristotle must only show that mixture is possible when confronted with the tripartite *aporia*.

(a) *An Aporia*

Argument One. Organisms are paradigms of natural substances (*Metaph. Z* 7, 1032^a18–19). As such, they are unities and individuals *par excellence*. Though there is much controversy among commentators as to how Aristotle accounts for a substance's unity of definition and for the metaphysical unity of its matter and form, one thing is clear. An individual substance cannot be composed of distinct individual substances. As Aristotle says, 'a substance cannot consist of substances present in it in actuality [*ἐντελεχεία*]; for things that are thus actually two are never actually one' (*Metaph. Z* 13, 1039^a4–6). The identity of an organ does not depend on the possession of its own unitary nature, but depends on the identity of the whole for which it came to be.

Argument Two. Organs are made up of tissues, e.g. flesh, bone, sinew, etc., and these tissues are homoeomerous mixtures of the simple bodies. For homoeomerous mixtures, there exists a route to identity that does not appeal to the role those tissues play as parts within an encompassing organism.

- (1) The ratio of simple bodies that serve as the ingredients of an animate tissue is sufficient to determine all of the mixture's interactive and non-interactive tangible differentiae. (Cf. *Meteor.* 4. 12, 390^b3–19.)

Aristotle treats animate and inanimate mixtures on a par when he remarks that 'in flesh and wood and each thing of this sort, fire and earth are present in capacity [*δυνάμει*]' (*De caelo* 3. 3, 302^a20).⁴⁸ So each tissue will have some natural temperature, some natural degree of heat, and some place towards which its locomotion naturally tends. Bone, for example, moves towards a point close to the centre of the sublunar sphere since earth predominates in its mixture.

- (2) A mixture that exercises natural interactive and non-interactive capacities possesses a unitary nature that is their principle.
- (3) A mixture's nature grounds its criterion of identity.
- (4) The *telos* of a body's unitary nature determines that body's natural unitary function.

⁴⁸ Cf. 'the mixture of the elements which makes flesh has a different ratio from that which makes bone' (*DA* 1. 4, 408^a14).

So:

- (5) Animate tissues have unitary identities/natures, and the ends of their natural capacities for change will determine their natural unitary function.

Corollary to Argument Two. A tissue of an animate body, *a*, and an inanimate mixture, *b*, can have identical tangible differentiae. If Argument Two is sound, then *a* and *b* will have the same unitary nature. But, for example, living bone and dead bone act very differently, as any corpse will testify. Only *b* seems to manifest the natural unitary function that is exhausted by its tangible differentiae. The only way to account for this difference in activity without denying that tissues have unitary natures is to attribute to the animating soul a power to constrain the nature of *a* violently so as to prevent it from exercising its natural unitary function.

If animate tissues possess unitary natures, the organs to which they belong will be aggregates of distinct natures, one corresponding to each of the parcels of homoeomerous tissue that compose it. A human being, say, would then be an aggregate of such aggregates. But not just any aggregate: a sack full of organs and tissues is certainly not a human. Each tissue would have to be arranged in such a way as to yield those organs (hypothetically) necessary for the exercise of the capacities distinctive of humans. The organs would have to be so organized as well. Since the natures of the tissues are, by Argument One, unitary, it makes little difference whether the natures of the animate tissues are identical to the natures of their inanimate correlates or not. In either case, the tissues would naturally move to some place of rest and would naturally interact in ways that would disrupt the required organization. Thus the soul *qua* organizing principle would be responsible for constraining the natural movements of its tissues.⁴⁹

⁴⁹ Aristotle often writes in a way that suggests this picture. When discussing plants, he raises the question 'What is it that holds together the fire and the earth, given that they tend in opposite directions? For they will be torn apart, unless there is something to prevent them.' Though he hedges, he says 'if there is, then this is the soul' (*DA* 2. 4, 416^a6–9). Moreover, this is not the popular *harmonia* account of soul that appears in Plato's *Phaedo* 85 e–86 c. In agreement with Aristotle, the proponent of this view can say that 'it is more appropriate to call health (or generally one of the good states of the body) a harmony than to predicate it of the soul' (*DA* 1. 4, 408^a1–2).

(b) The solution and being in energeia

The sympathies of two-body proponents lie with the second argument. When a man dies, bodies with identical tangible differentiae persist. But this assumes that such differentiae are sufficient to determine the identities of tissues regardless of the context of their coming to be. I shall argue that an enumeration of the tangible differentiae that mixtures manifest (if not constrained) is not always sufficient to attribute an internal principle of movement and rest to the body that is the subject of those differentiae.

An additional factor is required, and it becomes clear once we appreciate the distinction Aristotle makes between two ways of being: being in *dunamis*, i.e. being in capacity, and being in *energeia*, i.e. actually or actively being (*Metaph.* Θ 6). This distinction is orthogonal to the distinction among ways of being presented in the *Categories* (*Metaph.* Θ 10, 1051^a34 ff.). Our focus will be on the application of this distinction to the category substance (*ousia*). That is, we shall focus on two ways something can be an *F*—in capacity and in *energeia*.

To be an *F* in *energeia* is not simply to possess the set of capacities characteristic of *F*s. A house-builder, when watching television, has the capacity to build houses. This is one way to be a house-builder. But it is only when the art is being used in the production of a house that she is a house-builder in *energeia*. Being engaged in the process of house-building is a different way one can be a house-builder. Similarly, a sighted person with eyes shut becomes a seer in *energeia* only when her eyes open and the capacity for vision is being exercised.

But the distinction is broader than these cases suggest (*Metaph.* Θ 6, 1048^a35–^b9). Aristotle considers the relations between (*a*) matter (a block of wood) and that which is separable from matter (a statue carved out of the block) and between (*b*) that which is unworked (a pile of bricks) and that which is worked to completion (a house of bricks) to be analogous relations. In these cases, the relata are *one thing*, but they are that thing in different ways. A block of wood and a pile of bricks are, respectively, a statue and a house in capacity. I take it that this status, as in the above examples, consists, at least in part, in the various capacities these items possess. To be an *F* in capacity, something must possess the tangible capacities

(hypothetically) necessary for an *F* to come to be.⁵⁰ The other relata, the statue and the house, are said to be such in *energeia*. If the analogy is to hold, this status must consist in the products being, in some sense, the exercises of the capacities just mentioned. Perhaps the tangible capacities are taken advantage of by the artificer and are exercised in an order that results in the relevant composite. For example, if bricks are a house in capacity because they have the strength to be laid upon one another to the height required for walls without toppling, then, when a house-builder arranges things so that this capacity can be exercised, the result is a house in *energeia*.

This account, whatever its merits, cannot be complete. It is given with respect to artefacts and seems to depend on the satisfiability of the CS principle for its plausibility. It is not bricks and a house that are related on this account; it is bricks and bricks. The bricks have being in two ways: before the artificer practises her art, they possess various capacities that are not being exercised; after she practises her art, the capacities are being exercised.

If we switch our focus to those beings that have natural unitary functions, the story must be altered significantly. Consider the mixture that results from a parcel of fire and a parcel of earth. These two parcels, before the mixing occurs, are the mixture in capacity. Our previous necessary condition will still hold—to be the mixture in capacity, the parcels must possess the appropriate interactive and non-interactive tangible differentiae necessary for the mixture to come to be. But this does not seem to be sufficient. To be an *F* in capacity and to be an *F* in *energeia* are two ways of being *the same thing*. In the artefactual case, this was satisfied by recognizing that the same bricks were present before and after the artificer employed her craft; to be a house in capacity and a house in *energeia* were two ways to be bricks. But this cannot hold for the simple bodies. Aristotle is explicit that the simple bodies that exist in a mixture do not have being in *energeia*.⁵¹ So we are forced into the reading that is closer to the text but more difficult philosophically: the simple bodies are the mixture in capacity, the

⁵⁰ See sect. 2(b), item (ii).

⁵¹ Perhaps the simple bodies, though existing only in capacity, are still the mixture in *energeia*. That this is not so will be argued in sect. 5(b). For now, note the dissimilarity between this case and the case of the bricks. The bricks exist in *energeia* both before and after the house is built.

mixture is the mixture in *energeia*, and these are two ways of being *the mixture*.

Two questions must now be answered: (a) what further conditions must be met in order for the simple bodies *to be* the mixture in capacity? and (b) what is it for a mixture to be in *energeia*?

(a) Not just any parcels of fire and earth can be the mixture in capacity. There is an incredible number of mereological aggregates of parcels of fire and parcels of earth that have tangible differentiae sufficient to make such a mixture. In order to be a particular mixture in capacity, the parcels would have to be so situated that the changes that they would undergo through the exercise of their natures would necessarily result in the mixture if not constrained. In a related context, Aristotle says that 'the seed is not yet a human being in capacity (for it needs to fall into another and to change), but whenever it may already be of this sort through its own source, at that point will be this in capacity' (*Metaph. Θ 7, 1049^a12-15*). To be of a sort through one's own source is to be such that the exercise of the capacities that constitute one's nature *will result* in a product that is of that sort. The exercise can be interrupted and no product need result, but the conditions must allow that the uninterrupted exercise of natural capacities would result in the product in question.

(b) For a mixture to be in *energeia* is, if the analogy is sound, for it to be in the way that a house-builder is when she is pursuing her art. To be a mixture is, in an inorganic context, to have a unitary nature that is derived from but is not eliminable in favour of the natures of its ingredients. To have such a nature is to have some determinate interactive and non-interactive tangible capacities. Thus, to be a mixture in *energeia* is to be in such a way that those capacities are being exercised; it is to be in such a way that it is exercising its natural unitary function. To persist as such will require the continuous exercise of this function. This exercise need not result in a change. The mixture, for example, may reach its natural place of rest and cease to move. But to exemplify one's natural unitary function in its entirety is as much of an exercise of one's capacities as are the changes that must be undergone in order to exemplify one's form in its entirety.

Now a parcel of animate flesh and a parcel of inanimate flesh with the same tangible differentiae are not identical. This can now be seen by considering in turn the two manners in which something

can be. An account of being an *F* in capacity will include a description of the natural principles whose exercise is necessary in order for a complete exemplification of an *F* to come to be. An account of being an *F* in *energeia* will include a description of a unitary function the exercise of which results in persistence as an *F*.

The coming to be of an inorganic mixture with tangible differentiae that are identical to those of a living tissue can be explained in the same way as that of any inorganic mixture, e.g. gold or copper. This account has already been provided. If we assume that the simple bodies are arranged so that the exercise of their natural capacities will result in the mixture, then those simple bodies will be the mixture in capacity. Commensurate bodies will come into contact through their natural locomotion and mix with one another producing a homoeomerous body with a unitary nature that is the composition of the ingredient's natures. The entire process can be explained by appealing to nothing other than the natures of the ingredients.⁵² The principles in virtue of which an inanimate mixture persists as such are also exhausted by an appeal to the mixture's tangible capacities. As argued above, these capacities exhaust the nature of inorganic mixtures.

This is not the case with the corresponding animate tissue. As Aristotle says, 'hardness and softness, stickiness and brittleness, and whatever other qualities are found in the parts that have life and soul, may be caused by mere heat and cold, yet, when we come to the principle in virtue of which flesh is flesh and bone is bone, that is no longer so' (*GA* 2. 1, 734^b31-4). The tangible differentiae of the animate tissue can be explained by appealing solely to the ratio of the primitive contraries that compose them. But neither the natures of the ingredients nor anything which can be determined solely on this basis is the principle in virtue of which the animate tissue comes to be with those differentiae. Aristotle identifies this principle as 'the movement set up by the male parent, who is in actuality [*ἐντελεχεία*] what that out of which the offspring is made is in capacity [*δυνάμει*]' (*GA* 2. 1, 734^b34-5). It is not primarily the natural capacities of the simple bodies that are being exercised in the creation and organization of an animate individual, it is the capacities associated with the form of that animate individual itself that

⁵² Perhaps one will have to appeal to the circular motion of the heavens or the influence of the unmoved mover, but these factors will apply universally to all sublunar bodies and will not be the source of discrepancies in identification.

are being exercised when the semen of the individual's male progenitor interacts with the *katamēnia* within the female progenitor's uterus so as to produce the appropriate mixtures and their proper organization.⁵³ If one assumes contact, the explanation of mixing need only appeal to the interactive tangible differentiae of the interacting bodies. But that these bodies are brought into contact in the ratio and order (hypothetically) necessary for an organism to come to be requires the manifestation of a unitary nature whose natural unitary function has as its end the form of such an organism. It does not result from interactions consequent on rectilinear motions towards sublunar locations (cf. *Phys.* 2. 9, 200^a31–4). It is only in so far as they are subjects of a process that has as its end the generation of an organism that the simple bodies are that organism in capacity.

This developmental principle is the same principle that maintains the tissues as such once they are generated.⁵⁴ In nutrition, food is acted upon by that which is nourished in such a way that it is assimilated to the latter's nature. But the agent of nutrition is the human being, the 'ensouled body, *qua* ensouled' (*DA* 2. 4, 416^b10), not its organs or tissues. So in order for nutrition to be possible, the agent of nutrition must be of a unitary nature. It is only then that this 'first principle of the soul' can be 'an ability [*δύναμις*] such as to maintain its possessor as such' (*DA* 2. 4, 416^b18–19).

So organic tissues have material natures that are exhausted by their tangible differentiae but do not have internal principles of motion and rest. Like the organs that they compose, organic homoeomerous tissues depend for their identity on the coming to be of the whole organism to which they belong.

⁵³ Interpretative allies abound: 'Democritean necessity does not suffice to explain the coming to be of any fully-developed plant or animal: you cannot start from the presence of certain materials and trace a connected series of changes, resulting from nothing but necessities belonging to the natures and powers of the materials present, that leads up to the fully-formed living thing as its outcome' (Cooper, 'Necessity', 143), and 'the development of a living organism is *not* the result of a sum of actualizations of element-potentials the identification of which includes no mention of the form of the mature organism' (Gotthelf, 'Final', 213).

⁵⁴ Reproduction and nourishment are both functions of the nutritive soul. Cf. *DA* 2. 4, 415^a22, 416^a19; *GA* 2. 4, 740^b30–6.

5. The two-body thesis

So what, given the intricacies of inorganic and organic unity, is the fate of the two-body thesis? In what follows, two versions of the thesis will be described and assessed in the light of our conclusions.

(a) *The artefact model*

One way to uphold the two-body thesis is to deny that there is any significant difference between living and artefactual hylomorphic composites. I shall take Christopher Shields as the paradigm proponent of such an approach as his view culminates with the claim that ‘non-organic bodies exist before and survive the death of the organism. Just as the iron of an axe co-exists with axe matter [i.e. iron shaped so that it can chop], so the non-organic body exists while organic bodies exist.’⁵⁵

Shields is able to make this assimilation by ignoring factors that contribute to an object’s identification. As I have argued, the identification of a body as an *F* must take into account the two ways in which something can be an *F*. In the case of organic unities, the principle in virtue of which some material can be an ensouled body in capacity is the very same principle in virtue of which the ensouled composite actively persists as such. It is not, as Shields claims, simply the case that ‘an individual *x* will belong to a kind or class *F* iff: *x* can perform the function of that kind or class’.⁵⁶ On this principle of mere functional determination an artificial heart will be classified as a heart, a rock that happens to have a particular shape will be classified as a chair, and a spontaneously generated being, e.g. Davidson’s swamp-man, will be classified as a human being. These class determinations ride roughshod over fundamental Aristotelian tenets.⁵⁷

Even given the functional determination thesis, Shields’s account is incomplete. Take his analysis of non-organic bodies:

Non-organic Body (NOB): *x* is the non-organic body of a human being iff: (i) *x* occupies space in itself (*kath’ hauto*); (ii) at t_1 *x* can perform the functions of a human being; and (iii) at t_2 *x* cannot perform the functions of a human being. (Shields, *Order*, 137)

⁵⁵ Shields, *Order*, 152, explication added.

⁵⁶ Shields, *Order*, 33.

⁵⁷ This principle also blurs the distinction between local and terminal non-functioning.

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This assumes that there is one thing, x , which can exist at two different times despite its having different functional capacities at those times. There must be an independent way of identifying x that grounds the account, and none is provided that will satisfy our constraints.

The difference between artefacts and organic bodies is not, however, entirely obvious, and it is to this distinction that I now turn with the hope of clarifying the present account. An artefact, say a bed, is a product of *technē*. Though unlikely, it is conceivable that simple bodies could interact naturally so as to produce something that is indistinguishable from a bed. But this would *not* be an artefact; it would be an aggregate of homoeomerous mixtures—some wood, some iron, etc. There would be no artefactual unity. The artefactual unity accorded to an artefact is the result of its being an actualization of a form present in the mind of the artificer. The artificer takes natural bodies and moves them in ways contrary to their natures so as to create an object that instantiates a predetermined form. The product does not have any internal unity: that is, the whole does not possess an internal principle of movement and rest. Each of the natural components retains its nature; *qua* natural a bed is an aggregate. Thus a bed that is buried issues wood and not another bed (*Phys.* 2. 1, 193^b10). But the bed does possess an artefactual unity, and this unity depends on its being the actualization, through *technē*, of a unitary form. Artefacts are by-products of the natural actions of artificers. The fulfilment of an artefactual function is simultaneously the flourishing of a human being *qua* artificer.

But a human being, say, *is* a natural unity. It is the exercise of the natural unitary function of man in the semen that moves the simple bodies against their natures so as to create a human being, and it is this same natural unitary function that, when continuously exercised, maintains the human being as such through nutrition. The homoeomerous tissues have material natures, but they do not have natures in the sense of having local internal principles of motion and rest that ground identity and natural unitary functions. For ‘nature is twofold, the matter and the form, of which the latter is the end’ (*Phys.* 2. 8, 199^a30–3).

So while ‘every sort of thing produced naturally or by an art is produced by a thing existing actually [*ἐνεργείᾳ*] out of what is that sort of thing in capacity [*δυνάμει*]’ (*GA* 2. 1, 734^b21–2), those

things produced naturally are produced by something ‘which is actually [*ἐντελεχεία*] what the thing out of which the product comes is in capacity [*δυνάμει*]’ (*GA* 2. 1, 734^b35), whereas artefacts are produced by something that is not actually what the thing out of which the product comes is in capacity. Nothing is actually a bed before the bed is produced.

The matter of an artefact and the matter of a natural unity are very different. The parts of artefacts are natural unities with autonomous natural unitary functions. The unity of the whole is a by-product of the activities of the artificer; an artefact does not come to be by the natural activities of something that possesses that unity. Natural unities, on the other hand, do not have parts that are autonomous natural unities. The organs and tissues come to be in virtue of the activities of something that actually exemplifies the relevant unitary nature. So the wood and iron of a bed can satisfy the CS requirement. The wood is actually present in the bed, is identifiable independently of its being the wood of a bed, and is not necessarily the wood of a bed. The same cannot be said of the organs and tissues of an organic composite.

(b) *The mixture model*

A more promising approach to the two-body thesis is proposed, in slightly different forms, by Jennifer Whiting and Frank Lewis.⁵⁸ They claim that the non-organic body is present below the level of an animal’s organs and tissues: that is, the non-organic body is the totality of simple bodies that exist in capacity within the organic homoeomerous tissues.⁵⁹

Each of these views is committed to the presence in an organic

⁵⁸ Whiting, ‘Living’, and F. Lewis, ‘Aristotle on the Relation between a Thing and its Matter’ [‘Thing’], in T. Scaltas, D. Charles, and M. L. Gill (eds.), *Unity, Identity, and Explanation in Aristotle’s Metaphysics* (Oxford, 1994), 247–77.

⁵⁹ Lewis also argues for a distinct thesis: an animal’s form is essential both to the animal and to the animal’s body, but the animal and the body are different. This is because the animal’s form is an internal principle of behaviour for the animal, but, in the same way that heat relates to blood, the animal’s form is an external principle of behaviour for the body (Lewis, ‘Thing’, 268–72). This independent thesis aims to provide a distinction between the proximate matter of an animal and the animal itself. Though not argued for in detail, I take the present account to be an analysis of hylomorphism that does identify the proximate matter with the organic composite, but does not appeal to the projectivism of W. Sellars, ‘Aristotle’s Metaphysics: An Interpretation’, in id., *Philosophical Perspectives* (Springfield, Ill., 1967), 73–124 at 188.

composite of something that can be entirely identified without appeal to (and can thereby exist without) a soul. For Lewis, there is the 'material basis for the flesh or bone, which comprises all the correct material parts, but which can exist independently of the animal's form or soul'. This material basis is the concurrent matter of the homoeomerous tissues, 'namely so much potential earth, air, fire, and water, each of which is *part of the (concurrent) matter* of the flesh but (since each is only potential earth, air, and the rest) *not* one of its *spatially determined parts*'.⁶⁰ For Whiting, a man and his corpse are both 'constituted by flesh and blood in the sense that the contraries are still present [in the corpse] in roughly those proportions causally necessary (but not sufficient) for the existence of functional flesh and blood'. Again, 'the elements survive in the homoeomerous parts and these elements have accidentally characteristics which belong primarily and essentially to the organic body and its functionally defined parts—in particular, the characteristic of being alive or ensouled'.⁶¹

I agree that an organic tissue and an inorganic body can have identical tangible differentiae. And in order to have identical tangible differentiae, two homoeomerous bodies must comprise identical ratios of simple bodies existing in capacity. But these ratios, in and of themselves, cannot determine the identity of anything, let alone the identity of something that could exist with or without a soul. In inorganic contexts, one can use tangible differentiae to determine the identity of a homoeomerous body because, in such a context, the body will possess a unitary nature that is the principle of those differentiae. It is this nature that determines the identity of the body. But this shortcut is not universally available, and the presence of bodies with identical ratios in living composites and corpses does not guarantee that the objects characterized by these ratios are identical.

But what about the simple bodies themselves? Are these not present, in capacity, in both a living composite and its corpse? Yes, but not in a way that would be satisfying to a two-body theorist. As we have seen, a mixture possesses a nature that depends both aetiologically and ontologically on the natures of the simple bodies. Without these dependencies, mixtures would not have the tangible differentiae that they do. But the characteristic activities of a mix-

⁶⁰ Lewis, 'Thing', 273 and 274 (emphasis original).

⁶¹ Whiting, 'Living', 80 and 84.

ture have as their source a single unitary nature. The simple bodies that exist in capacity and compose the mixture are not present in a way that would make it sensible to think of them as constrained by some external principle. If this were so, a mixture would not have a unitary nature; it would be an aggregate of unitary natures violently bound together.

6. Conclusion

The argument of this paper rests on two pillars: an account of what it is for body to be natural and an account of the two ways in which a body can be so natured—in capacity and in *energeia*. Given these accounts, it follows that there is nothing in an organic composite that will satisfy the CS requirement. Neither the organs nor the tissues will do: organic composites possess natures that are the principle in virtue of which their organs and tissues come to be and persist as such, and this must be appealed to in the identification of those bodies. Nor will any sum of simple bodies do: the simple bodies that serve as the ingredients of the homoeomerous tissues exist only in capacity, and the natural unity of mixtures precludes the simple bodies from serving as the contingently identifiable matter of either organic or inorganic mixtures.

Asking for the matter of man is not like asking for the matter of a bed or the matter of a bundle of sticks. Organic unities, despite their complexity, are, first and foremost, *natural* unities. To ask for the matter of man is more like asking for the matter of a parcel of earth, or the matter of a homoeomerous mixture. When natural unities are the subject, be they organic or inorganic, such enquiries will not issue in an object identifiable independently of the unitary nature of the whole. The matter of man is, essentially, the matter of *man*.

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BIBLIOGRAPHY

- Ackrill, J. L., 'Aristotle's Definitions of *psuchē*', *Proceedings of the Aristotelian Society*, 73 (1972), 119–33.
Barnes, J. (ed.), *The Complete Works of Aristotle: The Revised Oxford Translation* (Princeton, 1984).

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- Bigelow, J., and Pargetter, R., 'Functions', *Journal of Philosophy*, 84 (1987), 181–96.
- Bodnár, I., 'Movers and Elemental Motions in Aristotle', *OSAP* 15 (1997), 81–117.
- Bogen, J., 'Fire in the Belly', *Pacific Philosophical Quarterly*, 76/3–4 (1995), 370–405.
- Charlton, W., *Aristotle's Physics I–II* (Oxford, 1970).
- Code, A., and Moravcsik, J., 'Explaining Various Forms of Living', in Nussbaum and Rorty (eds.), *Essays*, 129–45.
- Cohen, S. M., *Aristotle on Nature and Incomplete Substance* (Cambridge, 1996).
- 'Hylomorphism and Functionalism' ['Hylomorphism'], in Nussbaum and Rorty (eds.), *Essays*, 57–73.
- Cooper, J., 'Hypothetical Necessity' ['Necessity'], in A. Gotthelf (ed.), *Aristotle on Nature and Living Things* (Pittsburgh, 1986), 151–67; repr. in J. Cooper, *Knowledge, Nature, and the Good* (Princeton, 2001), 130–47.
- Fine, K., 'The Problem of Mixture', *Pacific Philosophical Quarterly*, 76/3–4 (1995), 266–369.
- Furth, M., *Substance, Form, and Psyche* (Cambridge, 1988).
- Gill, M. L., 'Aristotle on Matters of Life and Death', *Proceedings of the Boston Area Colloquium in Ancient Philosophy*, 4 (1989), 187–205.
- *Aristotle on Substance* [*Substance*] (Princeton, 1989).
- Gotthelf, A., 'Aristotle's Conception of Final Causality' and 'Postscript 1986' ['Final'], in A. Gotthelf and J. Lennox (eds.), *Philosophical Issues in Aristotle's Biology* (Cambridge, 1986), 204–42; originally published in *Review of Metaphysics*, 30 (1976), 226–54.
- Hamlyn, D. W., *Aristotle's De Anima, Books I and II* [*Anima*] (Oxford, 1968).
- Irwin, T., *Aristotle's First Principles* [*Principles*] (Oxford, 1988).
- Kelsey, S., 'Aristotle's Definition of Nature', *OSAP* 25 (2003), 59–88.
- Lennox, J., 'Material and Formal Natures in Aristotle's *De Partibus Animalium*', in id., *Aristotle's Philosophy of Biology* (Cambridge 2001), 182–204.
- Lewis, F., 'Aristotle on the Relation between a Thing and its Matter' ['Thing'], in T. Scaltas, D. Charles, and M. L. Gill (eds.), *Unity, Identity, and Explanation in Aristotle's Metaphysics* (Oxford, 1994), 247–77.
- Nussbaum, M. C., and Rorty, A. O. (eds.), *Essays on Aristotle's De Anima* [*Essays*] (Oxford, 1992).
- Sellars, W., 'Aristotle's Metaphysics: An Interpretation', in id., *Philosophical Perspectives* (Springfield, Ill., 1967), 73–124.
- Shields, C., *Order in Multiplicity* [*Order*] (Oxford, 1999).
- Whiting, J., 'Living Bodies' ['Living'], in Nussbaum and Rorty (eds.), *Essays*, 75–92.

Williams, B., 'Hylomorphism', *OSAP* 4 (1986), 189–99.

Williams, C. J. F. (trans. and comm.), *Aristotle's De Generatione et Corruptione* (Oxford, 1982).

Wright, L., 'Functions', *Philosophical Review*, 82/2 (1973), 139–68.