CHAPTER 6

The Relation between Matter and Form in Artefacts

Artefacts are hylomorphic compounds. Their forms are neither eternal nor principles of motions and activities. Yet, artefacts nonetheless possess forms. The aim of this chapter is to identify some features of the forms of artefacts and to investigate their relation to matter, by adopting the perspective of the natural philosopher and the artisan. This perspective emphasises the role of functions both diachronically and synchronically. I will therefore begin with Aristotle's identification of artefact-kinds with final causes or functions, before turning to the relation between matter and form and investigating the distinction between diachronic and synchronic matter. Diachronic matter will then be more closely examined in relation to the distinction between proximate and remote matter. The diachronic matter of artefacts entertains a many-to-many relationship with the form of the object, which translates into an accidental relation between synchronic matter and the form of the object. I argue that the forms of artefacts are external to their matter and that this is the reason why the synchronic matter of artefacts is not essentially functional. There is a significant deficit of unity in artefacts, but this deficit does not yet tell us anything about the substantiality of artefacts. In order for this deficit to teach us something about substantiality, we must adopt the perspective of the metaphysician.

6.1 Artefact-Kinds as Functions

There is such a thing as the form of an artefact. However, the forms of artefacts lack the efficient role that the soul plays in living beings. What role is then left for their forms? A common answer – including in the contemporary debate – is that forms of artefacts are functions. Indeed, if forms are essences that explain what the object is, one way to do this is to identify what the object can do. An object can properly be said to belong to a kind *K* only if it is able to perform the activities characteristic of *K*s. Such a functional analysis aimed at organising different kinds of objects is,

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however, typical of the natural philosopher and the artisan. This does not mean that this approach is inappropriate, but only that functions are the primary focus of the physicist and the artisan, as we see in Aristotle's works of natural philosophy. Functional analyses of natural and artificial beings are found primarily in the *Physics*, *DA*, *Meteor.*, and the biological works – which are all works of natural philosophy. For instance, *DA* provides a functional analysis of the different kinds of soul, the *Physics* introduces the principle of hypothetical necessity and the biological works describe the nature of organic parts with reference to their functions.[1] In the *Met.*, a functional analysis translates into an emphasis on the efficient cause. Whether or not a certain being has a function of the kind *K* depends on the efficient cause. The perspective of the physicist coincides with that of the artisan, with the only difference being that the physicist has the actual object before them, while the artisan only has the object in mind and must bring it into existence. Much of the process of thinking in which the artisan engages in order to produce a certain object coincides with that of the natural philosopher. As Caston (2006, 321) puts it, 'One begins by looking at the type of activities a living being can perform, in order to develop a functional analysis of the capacities required for such activities. Only then can one turn to the details of how these capacities are implemented in specific material, and how these might malfunction in various ways.' This is a fair description of the approach of the natural philosopher, as well as of the artisan. A functional account as the one of the natural scientist and the maker differs from the approach taken by the mathematician. While the mathematician deals with their objects in abstraction from the perceptible matter, the natural philosopher must take the perceptible matter into their account, for things like man and anger are like the snub.[2] In the cases of the natural philosopher and the maker, the inclusion of the matter entails understanding how matter or the parts contribute to the end or function of the object.

Aristotle goes through all of the causes of an artefact in *Met.* B 2, 996b5–8. In the case of a house, the efficient cause (*hothen men hê kinêsis*) is the art and the artisan (*hê technê kai ho oikodomos*);[3] the final cause (*hou d'eneka*) is the function or the work that the item is supposed to accomplish (*to ergon*);

[1] On functionalism in Aristotle's psychology, see Caston 2006, 320–2.

[2] We will return to this point in the final chapter. For this difference in Aristotle see *Phys.* 2.1 and *Met.* M 3, 1078a17. For a discussion, see Charles 2008; Johansen 2016.

[3] The interchangeability between art and the artisan as efficient causes is clearest in this passage. Art is efficient as a result of its being possessed by the artisan, who, in turn, can execute the specific movements required only by possessing the relevant art.

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the material cause (*hulê*) is earth and timbers (*gê kai lithoi*); and the formal cause (*to d'eidos*) is the account (*ho logos*). The form is identified with the account of the house, namely its essence. The question is what this *logos* entails. It is important to bear in mind that this *logos* entails a function if it is sought by a natural philosopher or an artisan, but, as I shall clarify in the next chapter, this *logos* does not necessarily entail a function if it is sought by a metaphysician.

In the *Physics*, the art analogy demonstrates that artefacts possess intrinsic ends, just like natural beings. In *PA* 1.1, 639b14–16, the *logos* is identified with the final cause, in both things constituted by nature and by art. In *DA* 1.1, 403b3–6, Aristotle states that a definition of a house including both the matter and the form would mention that the house is a 'shelter protective against destruction by winds and heat and storms (form) in stones, bricks, and timbers (matter)'. The form of the house is identified with its function or with the purpose for which was built (i.e. for the sake of protection). There is, of course, an issue about whether the definition of sensible substances should mention their matter, but for our purpose it is important to keep in mind that Aristotle here identifies the form of a house with its final cause. In other words, artefact-kinds exist, and they coincide with final causes. In *An. Post.* 2.11, an extremely complex chapter, Aristotle alludes to the example of the house as an illustration of a case in which the explanatory aspect is a final cause. The question is 'why is there a house?' and the answer appeals to its function: 'in order that his belongings are kept safe' or 'keeping them safe' (94b10–11). A house – as well as a statue – represents something that comes about neither spontaneously nor from necessity. A house does not come-to-be from necessity, but when it comes-to-be, it does so for some purpose. This purpose is what differentiates natural and artificial beings from everything else: the fact of the form being a final cause is exclusive to natural beings and artificial objects. According to *An. Post.* too, the *logos* entails the end, which means that artefact-kinds are functions.

That artefact-kinds are specifiable in terms of functions and that artefacts have intrinsic ends is nowhere disputed in the *Metaphysics*. We know that in many cases, particularly in axiologically superior ones, the form coincides with the final cause.[4] Only in Z 17, however, does Aristotle seem

[4] Aristotle is appealing to the artificial case, because it more clearly shows the distinction between the four causes: indeed, in the natural case, not only would the formal cause coincide with the final cause, but the moving cause would also coincide with the formal and final causes. See *Phys.* 2.7, 198a25ff. This is so because the soul plays all three roles (*DA* 2.4, 415b8ff). This topic was discussed in Chapter 5.

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to argue that the *logos* of the house entails a final cause. Aristotle addresses the question of why a certain matter, such as bricks and stones, is a certain object, such as a house. The answer makes reference to essence, which is identified with purpose (Z 17, 1041a28–9). If we answer the same question by appealing to the efficient cause, then we are engaging in an inquiry into the coming-to-be and passing-away of the item in question. By contrast, answering the question with an appeal to the final cause is typical of an inquiry into the being of the object. The being of the object is its purpose; that is to say, the form of the object is its final cause. It thus seems that accounting for an artefact's being means identifying its final cause, while accounting for a certain matter being a certain artefact means referring to a purpose or function. The question of why bricks and stones are a house must be answered with a *logos* mentioning the final cause.[5] The model of definition offered in Z 17 is arguably the same one presented in *An. Post.*[6]

The *logos* of a house, therefore, necessarily mentions its final cause. However, Aristotle seems to present several different ways of providing the *logos* of a house, and not all of them state the final cause. In *Met.* H 2, in a passage recalling *DA* 1.1, Aristotle distinguishes between a definition mentioning the form/actuality, a definition mentioning the matter/potentiality and, finally, a definition mentioning both the form and the matter. To say that a house is stones, bricks and timbers is to define the house in potentiality. To describe the house as a 'receptacle that shelters chattels and bodies' means to define the house in actuality. Thus, the *Met.* claims that the *logos* of an artefact can mention the final cause and that artefact-kinds can be identified with functions. The identification of artefact-kinds with functions rests upon the idea that artefacts do, in fact, have forms and that these are identifiable as functions. If it is agreed that forms of artefacts do exist and are identifiable as functions, artefact-kinds will then be functions.[7]

A possible objection to the view that, in the case of artefacts, formal and final causes coincide is that ultimately artefacts are made for the benefit of

[5] This seems to contradict the idea that the functional analysis is typical of the perspective of the physicist and the artisan. In the next chapter, I clarify that the functional analysis also belongs to the metaphysician's perspective, but neither primarily nor necessarily.

[6] Charles 2000, 2010a; Lewis 2013.

[7] Corkum (2023) argues that artefact-kinds are final causes or purposes and yet do not coincide with the maker's intention. Witt (2015b, 291–2) identifies artefact-kinds with proper functions. In this sense, she takes artefact-kinds to be similar to natural kinds and to differ from conventional kinds. For the opposite view, according to which artefact-kinds are not real, because artefacts do not have proper forms, see Bolton (2018, 288).

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human beings.[8] Indeed, Aristotle mentions the existence of two final causes.[9] In *Phys.* 2.2, 194a35–6, 'that for the sake of which' (*to hou heneka*) has two meanings (*dichôs*): the function of the object itself and those for whom the object is beneficial (*semen gar pôs kai hêmeis*), namely human beings.[10] This duality is also found in *DA* 2.4, 415b2–3 and *Met.* Λ 7, 1072b2–3. In the first passage, Aristotle states that the end (*to hou heneka*) is double (*ditton*), since it can mean either the end to be achieved (*to men hou*) or the entity for whose benefit (*to de hôi*) the end is achieved. In the second passage, 'that for the sake of which' and 'those for the benefit of whom' are set on a par (*esti har tini to hou heneka <kai> tinos*).[11] The fact that the final cause can be interpreted as being external to the object is certainly a concern and can be used against the claim that artefacts have a final cause at all. However, 'those for the benefit of whom' is presented as an additional sense in which one might say that something has a further end, which does not thereby rule out that function is the primary sense in which something can be said to have an end. Furthermore, the passage from *Met.* Λ 7 also discusses unmoved movers, such that if the second meaning of end jeopardises the primacy of the first one, it would also do so in the case of eternal bodies, which would consequently lack an inner final cause.

Natural and artificial beings are alike in possessing a form specifiable as their final cause. However, there is still an axiological difference between them. Aristotle often underscores that the final cause in natural beings is superior. In *PA* 1.1, 639b19–21, the final cause is identified with the good, and the final cause as good is to be found more in natural things. Whether this is to be explained by a broader axiological perspective or by the idea that natural beings are principles of artificial ones, but not the other way around (and indeed art perfects nature), or even by both (if the axiological difference is taken to derive from the causal one)[12] is a secondary issue in

[8] Reeve (2000, 60–1) argues that the artisan does not fully grasp the essence of their product because artefact-kinds have happiness as a component.

[9] One might raise the opposite objection (i.e. that there is no final cause at all) on the basis of *Phys.* 2.1, 193b12–18, where Aristotle says that art is no final cause. He suggests that while the process of the formation and development of, say, the embryo is teleologically directed towards the final cause (i.e. towards the acquisition of its own nature), the housebuilding process is directed towards the production of the house, not towards the art itself. At a closer look, however, this objection is groundless: Aristotle speaks of 'art', which is form_1, and he denies that art is final cause, not that the form in the object is a final cause. He maintains that form_2 is a final cause, for form_2 is not called 'art'.

[10] The first occurrence of the two ways of referring to the final cause must have been contained in the work *On Philosophy* (fr. 30 in Walzer and fr. 28 in Ross).

[11] For a different view according to which the end is humanity and that for the sake of which is God, see Sedley 1991.

[12] See Chapter 1 (Section 1.3.2).

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this context. What is most important is to acknowledge that artefacts' forms are specifiable as final causes, being in this way like natural beings and unlike those objects that are neither natural nor artificial in the strict sense.

Unlike the forms of living beings, however, artefacts do not operate as efficient causes. For an artefact to be of a certain kind, *K*, it must meet fewer requirements than a natural substance would: for a house to be a house, it needs to fulfil a function when acted upon, but is not required to perform it continuously. A house is a house if it can protect belongings. If it does not contain any belongings, it is still a house. The house will pass-away[13] only if it cannot provide shelter any longer, but not if it is merely not actually sheltering anything at a given point in time. This state of affairs directly depends on the fact that artificial forms are not efficient causes, since the efficient cause is the artisan and the form in their mind (i.e. art). The forms of living beings (i.e. souls) are such only when they are formal, final and efficient causes (since the soul is also an efficient cause): consequently, for an animal to be such, it needs to be able to perform certain functions by itself – and not only when it is acted upon. Note too that the animal does not need to be actually performing its function. For instance, a dog does not cease to be a dog when it is not eating or reproducing itself, just like an empty house is still a house, since the soul is, in fact, a first *energeia*. The difference between artefacts and living beings is rather that artefacts need to be able to perform their functions when acted upon, whereas living beings need to be able to perform their functions by themselves.[14] Things lacking a final cause will need to meet even fewer requirements to be what they are: for a rock to be a rock it does not need to perform a function, much less to be able to perform a function by itself or when acted upon.

Aristotle builds on Plato's problem of real kinds by accommodating artefacts too. He accepts the two-fold advice of the *Phaedrus* (i.e. to ask oneself the questions of when a multiplicity is a unity and whether a unity is the same as a natural unity). In the case of artefacts, indeed, what makes a multiplicity a unity is their function, and a unity is the same as a natural

[13] As for the case of the cup in *Met.* Δ 27, the object passes away when its substance is lost; that is, when the object cannot perform its function any longer (if acted upon, in the case of artefacts). Since the function is the inherent form, the maker or the operator may well be absent without this implying the corruption of the object. The same does not hold for living beings: the absence of the moving cause (i.e. the soul) means the passing-away of the object.

[14] To be sure, without denying that the soul is a second *energeia*, the ability to perform a function by oneself requires the more general activity of being alive. Surely, environmental aspects play a role in turning the soul from first to second actuality. See Chapter 3 (Section 3.2).

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unity, if by 'natural' we understand 'real'. After all, as the Eleatic Stranger says in the *Statesman*, one ought to look for real kinds. If forms of artefacts exist, artefact-kinds are no less real than natural kinds and are to be identified with functions. In what follows, I will examine the relation that forms and kinds of artefacts have with matter, sticking with the perspective of the physicist and the artisan – that is, I will investigate the relation between matter and the form as function.

6.2 Diachronic and Synchronic Matter

Diachronic matter is the matter ex quo (i.e. the matter out of which something comes into existence). By contrast, synchronic matter is the constitutive matter, the matter in which something consists (i.e. the matter *of* a thing and not *for* a thing). If the focus lies on the coming-to-be of something, whether natural or artificial, the matter at stake is diachronic matter. It is commonly said that in artefacts diachronic and synchronic matter coincide, whereas in living beings they do not. For instance, in the process of generation of a wooden box, the diachronic matter is wood. However, if we consider the wooden box in a synchronic dimension, the matter also seems to be wood. Synchronic and diachronic matter appear to coincide in artefacts, since wood is both the matter *for* and the matter *of* the box (i.e. both what the artefact is made from and what it is constituted of). The same principle seems to apply to artefacts that are not made of one material: bricks and stones are both diachronic and synchronic matter of the house. By contrast, in the case of living beings, the answer to the question of their matter is different depending on whether a synchronic or a diachronic point of view is assumed. In general, we can say that, in this case too, there is a matter *ex quo* (diachronic) and a matter *of* (synchronic). The synchronic matter of man is the body or the parts of the body (e.g. flesh and bones). With regard to diachronic matter, there are two main candidates for this role in the case of man: (i) the elements, such as earth and fire, or (ii) semen/menstrual fluid.[15] Earth and fire are mentioned as the matter of man only in Λ 5, 1071a14, but, especially from Θ 7,[16] it is clear that they are not the proper matter of man. We shall thus exclude the elements as candidates for being the specific matter of human beings. As we have seen,[17] in Θ 7 we find instead a mention of the semen. However, from the

[15] Since the living being in question is man, we should rather say that the possible candidates are either the organic *human* body, or *human* flesh and bones, or *katamênia*.

[16] I will return to this point in the next section. [17] See Chapter 4 (Section 4.2).

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biological works,[18] we know that this is not an appropriate candidate for being matter either. After all, Aristotle does not consider the semen to play the role of matter. A more proper candidate is the menstrual fluid. Not only in the biological works, but also in H 4, menstrual fluid is presented as the matter for offspring. The *katamênia* are usually identified with diachronic matter: from a genetic point of view, the matter out of which the human being comes-to-be are the *katamênia*.

In living beings, diachronic and synchronic matter do not seem to coincide, and this raises the so-called 'Ackrill problem'; that is, the tension between Aristotle's view that the matter of a living being is a body that is essentially ensouled, and his view that the matter of a substance already exists prior to its generation.[19] Whether one opts for flesh and bones or the body, there is still a reference to some matter that is different from the diachronic matter (i.e. menstrual fluid). If one asks what the matter of a man is rather than what the man comes into being out of, the answer would be the body or its parts. By contrast, when describing the way in which a given matter becomes another thing, menstrual fluid will be mentioned. Flesh and bones, as well as the body as a whole, are *only* synchronic, but not diachronic matter.[20] One cannot properly claim that a human being consists in his body *and* simultaneously claim that he came into being from the body. This poses a problem, since a natural substance would ultimately have two different matters. Two promising solutions to this difficulty have been advanced.

One solution suggests distinguishing between two kinds of matter.[21] Compositional matter is the material substratum that an object is made of and which persists through generation and corruption; functional matter consists in the parts insofar as they carry out a task, or a function, within a system. While the compositional matter of a man is the menstrual fluid, the functional matter of a man can be either flesh and bones (i.e. bodily parts) or the body. Both candidates conform to the homonymy thesis, according to which a certain 'final object' is such when it can perform its functions: if and when an object cannot perform its functions, it is called 'that thing' only equivocally. Aristotle applies this thesis to tissues, organs and the body itself.[22] He treats flesh and bones as matter at several points,

[18] For example, *GA* 1.21, 729a34ff. [19] Ackrill 1972.
[20] *Phys.* 190a15, 192a31, 226a10 and *Met.* B 4, 999b5, H 1 1042a32.
[21] Whiting 1992; Irwin 1988, 241–5.
[22] This must be what drives Byrne (2012, 2) towards the idea that the proximate material cause of biological organisms is their organs and larger bodily parts, the second and more remote material cause is homogenous compounds, such as flesh and bones, while the material elements are the

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especially in opposition to anhomoiomerous parts.[23] In the *Metaphysics*,[24] Aristotle often refers to flesh and bones as the matter of a human being in order to defend the idea that the form can be defined without mentioning the material parts. However, when he emphasises instead that the form cannot be defined without referring to matter, he prefers to mention the organs.[25] Although flesh and bones are less clearly functional than organs, they are still presented as conforming to the homonymy thesis.[26] This is not surprising, since flesh and bones are comparable to the foundations of a house: they are already synchronic matter or parts (i.e. they are already matter undergoing an actuality-inducing action). Additionally, Aristotle explicitly defends the functionality of biological parts at any level of complexity even when this is not evident.[27] The reader of *De Anima* would expect a mention of the body, which is synchronic matter as a whole, having life potentially not as parts like flesh and bones. According to this solution, artefacts and living beings are diametrically opposed in that only in the case of living beings do diachronic and synchronic matter fail to coincide, because they are different kinds of matter (i.e. compositional and functional).

Another solution to Ackrill's problem is proposed by Freeland, who argues that *katamênia* in human beings are comparable to the raw material in artefacts, in that they represent both diachronic and synchronic matter. In Freeland's view,[28] blood is an actual material part, as well as a matter underlying other human matter. Blood is diachronic inasmuch as it exists outside of and prior to the offspring; it is that out of which the offspring comes-to-be. At the same time, blood is synchronic inasmuch as it is an actual material part out of which the body is constituted. Another highly interesting thing about blood is that it is potentially what the following (and more manifestly functional) stages of matter actually are: blood is, for instance, potentially flesh. Therefore, Freeland claims that the relationship between diachronic and synchronic matter is one of identity, and that in this sense the case of living beings is just like that of artefacts. The bronze

ultimate material cause and exist separately. Byrne, however, regards the identification of the proximate matter with the organs as a problem, because, although they are functional parts, they do not persist through generation and corruption. He states that a good material cause must be independent from the living being, because it has to act as a substratum (*Phys.* 1.7, 190b3–5). He demands the same matter to be both diachronic and synchronic. The proximate matter suggested by Θ 7 is, however, the semen.

[23] *GA* 1.1, 715a9–11, *Meteor.* 4.12, 389b26–8. [24] *Met.* Z 8, 1034a6, I 9, 1058b7 and Z 10–1.
[25] See Ackrill 1972, 129.
[26] *Meteor.* 4.12 390a14–15, *GC* 1.5, 321b28–32 and *GA* 2.1, 734b24–31. [27] *Meteor.* 4.12, 389b27ff.
[28] For details, see Freeland 1987, 401, 406–7.

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out of which a statue comes-to-be is the same as the bronze out of which the completed statue is constituted – just like the body really is *katamênia*. The problem with this solution is that it seems speculative to describe menstrual fluid as synchronic matter. An animal is certainly made up of blood, but this does not mean that it is *katamênikon* and that the menstrual fluid coincides with body.[29] In *PA* 3.5, 668a17–19, Aristotle compares the stones placed at the foundations of a house to the blood canalised in the body. Although the stones and the blood are comparable as the matter *of* something, blood is not the same as the *katamênia*, namely the matter ex quo.

I shall propose a third interpretation that takes on board points from both solutions. From the first solution, I borrow the distinction between two kinds of matter, but I hold – with the proponents of the second solution – that diachronic and synchronic matter coincide in both artificial and natural cases. To simplify things somewhat, diachronic and synchronic matter coincide in both cases: both the diachronic and the synchronic matter of artefacts is compositional and both the diachronic and synchronic the matter of living beings is functional. The distinction between the two kinds of matter is important because only living beings have functional matter. In this sense, there is a significant difference between blood and the material of an artefact. When an artefact comes-to-be, the matter and its potentialities remain, in some respect, unchanged, whereas when a living being comes-to-be, the matter and its potentialities are transformed in the higher entity. As a result, it is quite difficult to re-identify the initial matter of a living being after its generation:[30] it possesses a dynamic matter that changes in relation to the form.[31] By contrast, the original matter of artefacts is in most cases easily re-identifiable, for the material persists relatively unchanged – that is, it is not functional. I shall argue that diachronic matter and form do not correspond one-to-one in artefacts. This situation reflects the fact that the diachronic matter of artefacts is completely passive and that the principle through which it is turned into the matter for a given thing, *F*, is external to it. By contrast, the diachronic matter of a living being is essentially the diachronic matter of a living being, because the principle in virtue of which it is the matter for a given thing, *F*, is internal to the matter itself. In a living being, diachronic and synchronic matter can be two different types of material (e.g.

[29] Kosman 1987, 375 n. 7: 'This is at best an accidental and weak sense: we wouldn't be monthly even if were made out of the monthlies.'

[30] See Byrne 2012, 15–16. [31] The next chapter will explain this point in more detail.

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menstrual fluid and body), but since it is by its own agency that the blood or the menstrual fluid turns into a body, one type of material naturally develops out of the other. In an artefact, by contrast, diachronic and synchronic matter are the same material (e.g. bronze in both cases), but since it is by means of an external principle that diachronic matter turns into synchronic matter, the latter is quite independent from the form. The diachronic and the synchronic matter of living beings are not two fundamentally different matters, because the former naturally develops into the latter. Although natural and intrinsic development is a transformation that can lead us to think that synchronic and diachronic matter are two different matters, it is precisely this intrinsic development that is the reason why there is ultimately only a single matter at issue.[32] In the case of artificial objects too, synchronic and diachronic matter coincide: for bricks and stones are both the matter out of which the house comes-to-be and the matter of which the house is constituted. With Freeland, I therefore contend that the relationship between diachronic and synchronic matter in both living beings and artefacts is one of identity, but – contra Freeland – I argue that the reason why the diachronic and synchronic matter of living beings coincide is not so much that the synchronic matter is *katamênikon*, but rather that the diachronic matter is *sômatikon*. Thus, the reason why synchronic and diachronic coincide in artefacts is, in a way, that the synchronic matter of artefacts is '*lithinê*'.[33]

In what follows, I shall first investigate in more detail the diachronic matter of artefacts, which can be further sub-divided into remote and proximate matter (Section 6.2.1). I shall focus, in particular, on proximate matter, its features (Section 6.2.2) and the conditions under which remote matter becomes proximate matter (Section 6.2.3). This will reveal that the diachronic matter of artefacts is not functional in the strict sense, but only in the sense that it is a suitable matter. It is not functional in the strict sense because it is not related to the form of the thing. Furthermore, an examination of the conditions under which remote matter becomes proximate matter will make clear that natural matter does not contain inner hindrances and is thus functional (i.e. it is related to the form on a one-to-one basis in virtue of its own principle). Once the diachronic matter of artefacts has been fully accounted for, I shall turn to synchronic matter (Section 6.3), its description as functional matter and the unity between matter and form.

[32] This does not yet mean that the body and the *katamênia* coincide, because the *katamênia* needs to change into something else only similar to itself.

[33] I am using *lithinê* (i.e. 'ston*en*') as a label covering the artificial synchronic matter as opposed to the natural one, which is *katamênikê*.

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A final discussion of persisting matter (i.e. the matter that remains after an actuality-withdrawing action) will test and confirm this account: what persists in the case of an artefact is identical to the proximate matter of that artefact, whereas what persists in the case of a living being is neither functional nor is it the proximate matter of the living being. A careful inquiry into diachronic and synchronic matter and their respective sub-divisions shows that diachronic and synchronic matter coincide in artefacts, because neither the diachronic nor the synchronic matter is functional, while they coincide in living beings for the opposite reason, namely because both the synchronic and the diachronic matter are functional. However, the characteristics of diachronic and synchronic matter in artefacts crucially reveals that the form of the object – although it inheres in the object – is external to its matter. Considering the problem of the unity between matter and form is thus the right approach to take to reach a better understanding of the metaphysical status of artefacts.

6.2.1 Remote and Proximate Matter

Diachronic matter can be understood either as proximate matter or remote matter. In other words, the distinction between proximate matter and remote matter specifically concerns diachronic matter. In attempting to determine the material cause of artefacts, we must first identify the right stage of matter to focus on. In the case of a given artefact, (e.g. a house), are we talking about bricks and stones, or earth and fire? In the case of a statue, are we talking about bronze, or about tin and copper or even about the elements? The matter of an artefact is, most of all, that stage of matter most closely related to the artefact itself. Thus, in the case of a house, mentioning earth and fire does not single out the matter of that particular object or kind of object, since earth and fire can be the matter of a very wide range of things. Indeed, every perceptible substance in the sublunary world is ultimately made out of the four elements, and these represent a stage of matter that is not itself made out of anything further.[34] It is therefore crucial to keep in mind the division of matter into degrees of *tode-ti*-ness as we found it in Θ 7. As we have seen in Chapter 4, Θ 7 elaborates a criterion for determining the stage of matter to which we must refer, by asking *when* a certain matter is potentially a certain object, (i.e. what is the proximate matter of an artefact).[35] That Θ 7 deals with

[34] *Cael.* 3.3, 302a16–28, *GC* 1.5, 320b12–14 and 2.1, 329a8–13, 24–32.

[35] *Pote* (1048b37): although this might seem to be merely a temporal question, the temporal and the metaphysical questions are closely linked in this discussion. Charles (2010b, 171–3) draws a stricter distinction between a question (A) asking 'Under what conditions is A potentially B?' and a question

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diachronic rather than synchronic matter is clear from the fact that Aristotle explicitly focuses on coming-to-be, both natural and artificial. He specifically speaks about the diachronic dimension of human generation. At the beginning of the chapter, he questions whether earth or semen (or anything else) is potentially a man (1049a1–3). After dealing with the case of artefacts, he clarifies that, in order to be potentially a man, semen must change by means of an internal principle (1049a14–16). Throughout the chapter, the matter is presented as that out of which something comes into existence. The mention of semen (1049a1–3 and 1049a14–16) as the matter of a man shows that it is diachronic matter that is at issue.

The stage of matter that is – properly speaking – potentially the object is distinguished from the other stages of matter. While Θ 7 divides remote matter into different stages, *Met.* Δ 4 and H 4 group all the stages of remote matter together into a common class that stands in contrast to the stage of proximate matter. Thus, *Met.* Δ 4, 1015a7–10 introduces a two-fold distinction regarding 'first matter', which can be either the matter that is first, without qualification, or the matter that is said to be first in relation to the object under consideration. In the case of artefacts, the first matter without qualification is said to be 'perhaps water', or whatever is common to all things. The first matter relative to a given object, such as a statue is, by contrast, bronze. The latter is the first matter of the thing in the sense of being its proximate matter (i.e. the matter we should investigate when dealing with the generation of a particular artefact), while the former lies farther back.[36] The two-fold distinction of *Met.* Δ 4 is a sort of simplification and reduction of all stages of matter to two: proximate matter and all of the other stages taken together under the label remote matter. H 4 also starts off by making a two-fold distinction in relation to matter:

> About material substance, it is necessary not to forget that even if all things are out of the same primary [material] or [out of] the same things as primary [elements], and if [there is] the same matter as principle in all the things that come-to-be, nevertheless there is a certain proximate [matter] of each; as of phlegm, [the first matter] is the sweets and the fats, but of bile, it is the bitter

(B) asking 'At what point/time is A potentially B?'. He argues that Aristotle is dealing with the second question, but also that the second question as narrower than and included in the first question. Charles concludes that 'it seems safest to take Aristotle as focusing in Θ 7 not on the full range of conditions under which something is potentially a B but on the narrower issue of the first point at which something is potentially a B'. Along these lines, I take the chapter to deal with a temporal question ('at what point?'), which falls under the broader metaphysical question about the conditions under which something is potentially B.

[36] Water and bronze are also mentioned as two types of matter in *Met* Δ 24, a chapter investigating the ways in which 'out of something' is said (1023a26–9).

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> or some other things – but perhaps these all are out of the same. There come-to-be several matters of the same thing, when one [matter] is matter of another, as phlegm is out of fat and sweet if the fat is out of the sweet, and [something] is out of bile by decomposing into its primary matter, the bile. For 'this out of that' is twofold; either this will be further along the way or is decomposed into its origin [matter]. (*Met.* H 4, 1044a15–25)

This two-fold distinction appears to correspond with the discussion of Θ 7 and Δ 4; there is: (i) a proximate matter, which is proper to each thing (*oikeia hekastou*); (ii) a matter that lies farther back, that is not proper to that particular object, but into which that object will turn when it decomposes.[37] The matter that must be referred to when enquiring into the matter of an artefact is the former. As Aristotle states at 4, 1044b1–3, 'it is necessary to state the nearest causes. "What is the matter?" Not fire, or earth, but the matter that is peculiar to the thing.' Against the suggestions made in Λ 5,[38] the matter that ought to be mentioned is not remote matter: the elements are the matter for living beings as well as for artefacts, hence they play no role in differentiating one thing from another. In order to identify the matter appropriate to a given item, one must follow the rules laid down in Θ 7, which apply to both natural and artificial beings.

6.2.2 *The Proximate Matter of Artefacts: The Many-to-Many Relationship*

Θ 7 indicates the stage of matter to which one should refer in order to speak about the appropriate matter, in the sense of the matter that is potentially the object in question. H 4 is crucial because it enriches the account of proximate matter and spells out important features of the matter of artefacts. The proximate matter of artefacts exhibits three main features: (i) the matter is not unique to just one object (F1); (ii) the matter is related to a limited range of objects (F2); (iii) one object does not require just one kind of matter (F3). These features show that the diachronic matter of artefacts is functional only in a loose sense (i.e. only insofar as it is suitable for a particular object). However, diachronic matter is merely compositional, because it has a many-to-many relation to the form and function of the thing.

[37] For a different interpretation, according to which the matter that is first unqualifiedly is not a particular matter lying 'farther back' but prime matter, see, for example, Kosman 1987; Gill 1989. They believe that H 4 presents a twofold distinction with respect to matter, but that it concerns (i) synchronic matter and (ii) diachronic matter.

[38] We have already mentioned *Met.* Λ 5, 1071a14 in the discussion of the synonymy principle in Chapter 4 (Section 4.3).

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The Same Matter for Different Objects

In some cases, different objects can come-to-be out of the same proximate matter. The first feature of the matter of artefacts is that the same matter can serve as the matter for different kinds of objects:

> And it can happen that different things come about although the matter is one,[39] because of the efficient cause: for instance, out of wood both a box and a couch. (H 4, 1044a25–7)

Wood can potentially be a box as well as a couch, meaning that it can be the proximate matter for different things. There seems to be nothing about a given portion of wood that makes it potentially only one kind of thing. Certainly, there is something about wood that makes it suitable to be turned into some things and not others, but wood as such is not necessarily potentially only one single thing (e.g. a box). If there is nothing about wood as such which makes it the potential matter for a box and not for a couch, what then is the cause of wood's being a box? Aristotle claims that the main cause for a given portion of matter being a particular kind of artefact is the efficient cause. That is to say, it is up to the artisan to turn the wood into a box rather than a couch. The efficient cause is a certain art that dictates the kind of object that is produced. Whether a couch or a box comes-to-be out of a given quantity of wood depends on whether the artisan is a couch-maker or a box-maker. Since proximate matter is one actuality-inducing action away from becoming a given object, this means that the matter is able to host more than one type of form. This does not seem to be the case for the matter of living beings. Aristotle mentions that the proximate matter of a living being is the menstrual fluid, which can be the matter only of that particular kind of living being. Thus, in the case of artefacts, the question of why a box came-to-be out of this wood makes more sense than it would in the case of living beings: the matter of an artefact is not necessarily restricted to being the matter of only one kind of thing. Wood can potentially become a wide range of things.

Matter Is Relative to a Limited Range of Objects

Aristotle then moves on to the second feature of matter and claims that the efficient cause's power to produce is not unlimited.[40]

[39] I take Θ 7 and H 4 to refer not to tokens (i.e. particular portions of matter) but to types of matter and types of things.

[40] As already discussed, the moving cause is the specific art at stake, which acquires efficient powers by being possessed by the artisan.

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> But for some things, since they are different, their matter must be different. For instance, a saw would not come about out of wood; this is not [in the power] of the efficient cause, for it will not make a saw out of wool or wood. (*Met.* H 4, 1044a27–9)

Depending upon how we interpret it, the claim that the proximate matter is related to a limited range of objects (F2) concerns either artefacts alone or both artefacts and living beings: (i) if we take it as stating the general principle of hypothetical necessity, according to which a particular object cannot be made out of any matter whatsoever, it holds for both artefacts and living beings; (ii) if, instead, we emphasise the idea that there is a *limited* range of matters for a given thing (which still leaves room for choice), it holds more properly of artefacts.[41] In the former case, the claim would be that in the case of artefacts (as well as of living beings) there is a limited range of possible matters out of which they could come-to-be, as opposed to an unlimited range of matters. In the latter case, the point would be rather that, in the case of artefacts, there is a limited range of matters out of which they can come-to-be, whereas in the case of living beings there is only one, single matter. Since F3 (i.e. one object does not require just one matter) – addressed in the next sub-section – concerns the latter case, I am inclined to interpret F2 (i.e. matter is related to a limited range of objects) as concerning both artefacts and living beings.[42]

There are properties of wood qua wood which make it suitable to be turned into some things rather than others by the efficient cause. This seems to be the main point of the argument. The efficient cause is what ultimately turns the wood into a box rather than a couch, but it cannot turn any given matter into any given thing: there is still something about matter which limits the range of things that come-to-be out of it. For instance, in *Meteor.* 4.9, Aristotle lists specific properties of wood: it is fragile but not frangible; it is neither easily indented nor malleable, but it is capable of being compressed; it can be split and cut. Furthermore, wood is capable of being burnt, it is inflammable, but not capable of being dissolved. In *Meteor.* 4.11, wood is counted among things that are

[41] According to Burnyeat (1984, 33), the second feature concerns only living beings. I do not see why this should be the case, given the example, the context and the fact that it clearly holds for artefacts.

[42] In general, the second feature appears to be valid both for artefacts and living beings. In fact, in all of the passages about hypothetical necessity, Aristotle mentions both artefacts (mainly tools) and living beings (mostly organs). Significantly, when dealing with living beings, Aristotle mentions either organs, such as hands or eyes, or even the body itself. This fact is of considerable interest, for it seems to shift the discussion from diachronic to synchronic matter. However, H 4 is still dealing with the diachronic matter. The shift is due to the retrospective view prompted by the natural philosopher's interest in the behaviour of things, rather than by the artisan's process of making.

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composed mostly of earth. These properties make it suitable to serve as matter for some things but not for others. The properties of wood explain why it can be a box or a couch, but the efficient cause is the ultimate cause of the wood's actually being a box or a couch. It cannot, however, be the cause of the wood's being a saw: although the proximate matter of artefacts is not merely the matter of one single thing – but can be the matter for various different items – it nevertheless cannot be the matter for anything whatsoever. A saw made of wood is simply not a saw. Every material has specific properties, and necessity inheres in these properties.[43]

In the scholarship, we find the well-known distinction between 'absolute necessity' and 'hypothetical necessity' upon which I shall concentrate in order to clarify the second feature of proximate matter. Absolute necessity concerns things that are absolutely necessary and cannot be otherwise. Cooper (1987) connects this necessity with the material qua itself, which thus possesses specific features in itself: it is absolutely necessary for wood to have these features.[44] Hypothetical necessity concerns the material qua matter for something, which is never absolutely necessary, but only necessary given a certain goal.[45] On the hypothesis that we are seeking to bring about a certain object (i.e. *if* the form *x* has to be), then a certain matter is necessary. *If* a saw must be, then some sort of hard matter is necessary, since in order to have a saw, it is necessary to have a matter that will enable it to perform the functions of a saw, i.e. to cut. Strictly speaking, hypothetical necessity refers in the first instance to hardness as the property required for the saw, and this property restricts the range of materials it can be made out of.[46] Hypothetical necessity is thus the relation between any object endowed with a teleological description and its matter. Everything that comes-to-be for the sake of something reflects this simple fact: the end can be accomplished only if the matter allows the realisation of such an end. This point does not exclusively apply to living beings. In *PA* 1.1, 639b21–640a10, Aristotle applies the conceptual framework of hypothetical necessity to account for everything that is generated or produced by art, that is, to both artefacts and living beings. These things are called 'final objects', for they all come-to-be for the sake of something. Whatever has to be produced or to exist in order for the end to be reached is hypothetically necessary in these entities. In *PA* 1.1, 642a2–24, Aristotle discusses hypothetical necessity with reference both to an artefact (an axe) and to a natural

[43] See Cooper 1987; Byrne 2019. [44] For a different view, see Balme 1992, 76–84.
[45] Cooper 1987, 263–4.
[46] Aristotle illustrates his account of hypothetical necessity in the second book of the *Physics*. See *Phys.* 2.9, 199b34ff.

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thing (the body). As for the production of an artefact, hypothetical necessity reflects the thought process of the artisan.[47] In *Phys.* 2.9, Aristotle proposes the example of a wall so as to clarify the distinction between necessity and hypothetical necessity (200a4). The wall consists of stones, foundations, earth and wood. According to the principle of hypothetical necessity, in order to make a wall, namely something that covers and protects, it is necessary for it to be constituted of materials that allow for these functions. Necessity as such, as opposed to hypothetical necessity, refers to the material as such: Aristotle explains that stones and foundations are heavy and tend to move downwards, and it is on account of this necessity that they are where they are; earth is lighter and placed on top of the stones and foundations; finally, wood is the lightest material, and for this reason it is placed on the top of the other materials. The same also applies to biological organs: in *PA*,[48] Aristotle explains that particular matters are suitable for constituting various organs precisely in virtue of their particular properties.

To sum up: from the last two passages, we can infer that two artefacts differ primarily due to the efficient cause (e.g. a box and a couch), but that sometimes they differ first and foremost due to their proximate matter (e.g. a box and a saw). As regards the matter of artefacts, it is not related to only one object, but some constraints are nonetheless set by the form, which is supposed to be realised in the matter. The form the artisan has in mind restricts the range of materials that can be used.

The Same Object out of Different Matters

The third feature (F3) of artefacts' matter is that different matters can serve as such for the same product:

> Therefore, if the same thing can be made out of different matter, it is clear that the art and the principle as efficient [cause] are the same; for if both the matter and the mover are different, then what has come about too. (*Met.* H 4, 1044a29–32)

It is not only the case that the efficient cause can make different objects out of the same matter but also that the same object can be produced out of different matters.[49] The many-to-many relationship between matter and

[47] It also reflects the procedure of the art: the art of cooking tells you how to make something, not just what the product is. See Chapter 4 (Section 4.1.1).

[48] See *PA* 2.8, 653b33–5 and 2.9, 654b28ff.

[49] The two cases can be also described in the following way: in the first case, = matter but ≠ form, whereas in the second case we have = form but ≠ matter.

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product is addressed from the opposite direction: not only can both the box and the couch come-to-be out of wood, but the couch, too, can come-to-be out of either wood or stone. In the former case, whether the matter becomes this or that object depends upon the efficient cause (i.e. the art). In the latter case, whether the object is made of this or that matter does not depend on the efficient cause, since the efficient cause is the same in both cases – it is according to the same art that a couch is wooden or stony. If one intends to make a couch, whether the couch is made out of wood or stone does not make the art different: in both cases, it is still the couch-building art. Given a particular art that makes a particular product, there is a range of materials that it can work with. Depending on the product in question, this range is broader or narrower, but it is not reducible to a single matter.[50] F3 is not illustrated with any concrete examples. The point, though, holds in both simple and more complex cases. The house needs be constituted out of materials that have properties such as those possessed by bricks, stones and timbers, but it can also be constituted out of wood or ice, as long as this is compatible with the performance of the thing's function.[51]

Let us now reconsider the main points laid out in H 4, bearing in mind that they concern the proximate matter discussed in Θ 7. F1, F2 and F3 refer to the stage of matter that is potentially a given object, in the sense of being one actuality-inducing action away from it:

F1 This matter is not unique to just one thing, since the same (proximate) matter can serve as the matter for different products. Aristotle mentions a raw material such as wood, which can become either a box or a couch, depending upon the art (i.e. the actuality-inducing action).

F2 This matter is related to a limited range of objects, as there are cases in which the matter must be different if the objects are different. A box and a couch are two different objects, but they do not need to be produced from different matters. By contrast, a saw and a box are two different objects, but they need to come-to-be out of different matters primarily because they are different objects with different functions. The proximate matter of a saw can be neither wood nor wool, according to the hypothetical necessity principle.

F3 One kind of object does not require just one matter.

[50] See *PA* 1.1, 642a9–11.

[51] As long as the function (i.e. the form) is the same, the objects are the same object. An igloo and a hut are made out of different materials (and are also constituted of different materials), but they have the same function and, hence, they are the same kind of object.

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While F2 imposes some restrictions on the choice of matters for the realisation of a certain artefact, F1 and F3 are complementary and seem to allow for a flexibility that is not possible in the case of living beings. According to F1 and F3, for this matter to serve as the matter for a given product, the efficient cause must intervene. According to F2, there is still something about matter (its properties) and the object (its function) that restricts the artisan's choice. A certain matter entails a certain range of objects, and a certain object imposes a certain range of matters. The combinations are not completely free, the relevant restrictions are found both in the matter and in the form. Therefore, in the case of artefacts, the relation between matter and form is a many-to-many relationship, as opposed to one-to-one. The matter is quite independent from the form and can remain autonomous.

We have said that F1 and F3 do not apply to living beings, but let us now spell this out in order to understand better the peculiarity of artefacts. In H 4, the focus on [a] artefacts is followed by a focus on [b] natural perishable substances, [c] natural eternal substances and [d] natural non-substances. As for [c], Aristotle states that another account is needed, whereas regarding [d] he identifies the matter of the eclipse and of sleep with the substance, understood as the substrate to which determinate features belong (i.e. respectively the moon and the animal (or its heart)). As for [b], Aristotle illustrates the causes of a man, including the material cause as follows (1044a32–b2): the mover is the semen; the form is the essence; that for the sake of which is completion; and he identifies the proximate matter of a living being, such as a human being, with the *katamênia*. In identifying the matter peculiar to man (*tên idion* – i.e. the proximate matter – at 1044b3), one should not mention earth and fire, but rather menstrual fluid.[52] In suggesting that the matter of a human being is the *katamênia*, Aristotle seems to hesitate: some scholars believe that his uncertainty is about whether the *katamênia* must be un-fertilised or fertilised in order to be considered the diachronic matter of a man. My view is that Aristotle takes the proximate matter to be the *katamênia* and its male counterpart, i.e. semen, right before the fertilisation. The conclusion we have drawn is that, in the case of artefacts, the relation between diachronic matter and form is many-to-many and the way in which this case is introduced ('it can happen that . . . ') suggests that *usually*[53] there is only one matter and that out of one matter only one

[52] Only in Λ 5, 1071a13–17, Aristotle cites the remote matter (i.e. fire and earth) as matter of man.
[53] 'Usually' or in the relevant cases (i.e. natural cases).

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thing comes-to-be. In the case of natural substances, the relation between diachronic matter and form is one-to-one. Thus, let us consider menstrual fluid in the case of a man as equivalent to wood in the case of a box and quickly run through the three points again:

F1 Is (human) menstrual fluid unique to man or can it be the matter of something else? It seems that the menstrual fluid is not suitable for being the proximate matter of any other being.[54] Menstrual fluid is limited being the matter of only one object, such that F1 does not apply to the matter of man.

F2 F2 taken generally as stating the principle of hypothetical necessity also applies to living beings.

F3 Can a man come-to-be out of a different matter than menstrual fluid? This does not seem to be the case for Aristotle.[55]

In general, F1 and F3 seem to express the fact that there is a many-to-many relationship between the proximate matter and the artificial object. Aristotle's biological works provide more details about such issues, but F1 and F3 seem to apply exclusively to the matter of artefacts. The discussion in H 4 marks an important difference between natural diachronic matter and artificial diachronic matter: the former enjoys a one-to-one relationship with the form of what comes into existence, whereas the latter does not. Why is the relation between proximate matter and form one-to-one in the case of living beings and not in the case of artefacts? I suggest that in

[54] One might reply that the horse's menstrual fluid is suitable for a horse as well as a mule. However, first of all, the mule is an exceptional case, which is also defined as being against nature. Second, Aristotle seems to suggest the possibility of a genus to which both horses and mules belong. One might also mention the case of hybrids as counter-examples that are completely natural, but, according to Aristotle, hybrids end up resembling more closely the female parent (i.e. the material contribution). In Section 6.4, it will become clear why a certain menstrual fluid produces only one kind of living being.

[55] One might reply that certain other animals can also come-to-be differently, such as spontaneously generated animals, which can come-to-be both by synonymous parents and by spontaneity. Leaving aside that, according to Aristotle's biological axiology, human beings represent the best case available, it is important to bear in mind the reason why some animals and plants can also come-to-be spontaneously. In these cases, matter can move by its own agency in the particular way required (see *Met.* Z 9). Although the principle oriented towards a certain form is not implanted in the being by a synonymous parent, the matter is equipped with such a principle oriented towards the form, and this is the relevant sense in which matter is the same. The case of spontaneously generated beings is still problematic if we imagine different species coming out of the same mud or rotting material. However, it seems that one kind of putrefaction allows for one kind of species. This seems at least to be how Asclepius of Tralles understands it when he comments on Z 9, at 408,1–5: 'Other things [come-to-be] not from the seed but from putrefaction, as for instance bees come-to-be from a dead rotten bull, and again some animals from another sort of putrefaction. As they say, worms come-to-be from human bodies.'

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order to answer this question it is necessary to understand how remote matter becomes proximate matter. While H 4 deals with the transition from proximate matter to synchronic matter, Θ 7 sheds light on the transition from remote matter to proximate matter.

6.2.3 The Sources of Hindrances in the Remote Matter of Artefacts

Θ 7 clarifies that the one-to-one relationship in living beings is due to the fact that the matter already possesses the principle in virtue of which it becomes the object, which means that the matter is essentially the matter of the object it becomes. By contrast, in the case of artefacts, the many-to-many relationship reflects the fact that matter, lacking the principle in virtue of which it becomes a certain object, is not essentially this object and is open as to what it can be. In order to explain fully why proximate matter has the features listed in H 4, we need to revisit the problem of remote matter and focus on the transition between remote matter and proximate matter as presented in *Met.* Θ 7. Natural diachronic matter is functional, for not only the transition from proximate matter to the object occurs 'through the matter itself', but also the transition from remote to proximate matter is achieved 'through its own principle'.

In Chapter 4 (Section 4.2), we addressed the conditions under which a certain matter is potentially a certain artefact (*Met.* Θ 7). A given matter is potentially *F* if there is only one change left for the object *F* to come-to-be, namely the actuality-inducing action of the artisan. In other words, bricks and stones are potentially a house if and only if bricks and stones can turn into a house through a single actuality-inducing action performed by the housebuilder. An examination of how this process works in the case of living beings casts light on a specific feature of the remote matter of artefacts (i.e. that it is filled with possible hindrances). This fact helps to clarify the many-to-many relationship even further: not only does the proximate matter lack the principle oriented towards the form, but the remote matter is already filled with hindrances before its transition to proximate matter. Looking at the natural case, Aristotle argues:

> Whereas for things where [the principle] is in the thing itself that has it, [it is] all such things [potentially] as will be through itself if nothing external interferes (*empodizontos*); e.g. the semen is not yet [potentially a man] (for it needs to be cast into another, and to change); but when through its own principle it is already in this state, then it is already potentially this [a man]; but the former is in need of another principle; just as earth is not yet

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potentially a statue – for it needs to change, and it will be bronze. (*Met.* Θ 7, 1049a13–18)

→ *A given matter is potentially a natural being F iff, provided that there is no external interference, the matter will be turned into the natural being F by a single actuality-inducing action.*

T*o sperma* potentially becomes a human being, or the proximate matter for a human being, when, *through its own principle* (*dia tês autou archês*), it changes – as long as nothing external interferes. What is *to sperma*? There are several options, all, to some extent, problematic:

i. Male sperm – However, *GA*'s theory does not present the male contribution as being material. It is the female residue that is supposed to play this role.
ii. A plant seed – Michael of Ephesus brings in the example of the grain becoming an ear of corn when it falls (*pesein*) on the soil. However, the beginning of the chapter makes clear that Aristotle has in mind the generation of a human being (1049a1–3).
iii. Female residue – (1) H 4 presents the female residue as already being proximate matter; (2) it is simply not true that the female residue needs to fall into something else.[56]

Given the context, the first option seems to be the most likely, for the following reasons: first, *to sperma* is most often referred to as the male residue; second, in *GA*, it is described as already being equipped with a certain power/principle; finally, it does, in fact, need to be cast into another, most probably the womb (or the female in general).[57] It is difficult to see in what sense the male residue can be called matter, but Aristotle might, in a dialectical move, be referring to the common, so-called "flower-pot" model, according to which the male residue is like a plant's seed that also constitutes the adult animal. This common view is addressed by taking the male residue as matter, but Aristotle himself would regard it as matter not because it makes a material contribution, but because it is similar to the female residue (which is more properly speaking matter). After all, both are blood, more or less concocted, with the degree of concoction resulting in a different generative function.[58]

[56] Menn (III03) challenges this reading by highlighting that the *katamênia* would not become an embryo if left to themselves.
[57] For a detailed and reliable discussion of the female contribution in animal generation, see Connell 2016.
[58] The case of sexual reproduction is indeed more intricate, since it requires the distinction between male and female.

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The presence of an agent in the matter allows it to turn into something that is potentially *F* when nothing external interferes, just as the matter that is potentially *F* will compose the matter that is actually *F*. Human residues become *katamênia* (i.e. potential human beings) through themselves (i.e. through the actuality-inducing action of the male sperm).[59] The *katamênia* are potentially the living being *F* because, provided that there is no external interference, they will turn into the living being *F* as result of the single actuality-inducing action of the sperm.[60] The remote matter (i.e. blood in general) thus becomes proximate matter (i.e. menstrual fluid and semen) through its own principle. One might say that the elements would not become blood if left to themselves. However, we do not need to go that far. After all, at the end of the section, Aristotle compares semen in the case of man with earth in the case of an artefact: in the generation of an animal, at least, we do not need to go back to the elements.[61] The temporal dimension of the whole chapter, together with the adoption of the perspective of the physicist and the artisan, is valid: it is never necessary to go back to the elements when dealing with the generation of an organism. The production of an artefact, by contrast, might require us to regress more deeply into the stages of matter.[62]

The only pre-condition for the proximate matter of a living being seems to be the absence of external interferences.[63] The fact that *to sperma* must change need not count as an internal hindrance because it changes *through its own principle*, thus simultaneously eliminating the distinction between the agent and the patient. The matter of artefacts, by contrast, does not potentially become the object through its own principle, since the agent lies outside the patient (i.e. matter) and, consequently, the proximate matter does not become the object through itself. There is a terminological difference between the artificial and the natural case that clearly illustrates the

[59] This also works for plants. In *GA* 2.2, 740a1, Aristotle explains that the seed contains the first principle of growth. This principle exists in the seed, at first potentially, and then, once it is differentiated, it sends out shoot and root.

[60] In Chapter 4 (Section 4.3.3), we saw that the male sperm is potentially a human being only in a secondary sense (i.e. in the sense of pre-condition), like the availability of tools in technical production.

[61] Perhaps something like *Phys.* 2.2, 194b7–8: 'In the products of art, however, we make the material with a view to the function, whereas in the products of nature the matter is there all along.'

[62] This is further proof that the perspective of the natural philosopher or, in this case, of the biologist significantly corresponds to the perspective of the maker.

[63] In Chapter 4 (Section 4.3.3), the male sperm is a pre-condition for something to come-to-be, like the tools in the technical production. Through a dialectical move, Aristotle here speaks of the male residue as matter, but we understand that he still thinks that the male sperm's availability is a pre-condition for the offspring to come-to-be and its absence can be understood an external interference.

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difference in how hindrances are conceived. When Aristotle addresses the case of things possessing an external principle, he says that something external could *hinder* the process. In the case of health, he states 'when it is willed it comes-to-be as long as nothing external hinders (*kôluontos*); on the other side, in what is being healed, when none of the things in it hinders (*kôluêi*)' (1049a6–8). In the case of the house, he talks about something hindering as well (i.e. *ei mêthen kôluei*). By contrast, in the case of living beings, Aristotle does not talk about hindering, but rather about *interfering* (*empodizontos*). In *Met.* Δ 5, 1015a26–8, Aristotle presents compulsion and the compulsory as a way to refer to necessity, and putting on a par choice (*tên prohairesin*) and hindrances (*kôlutikon*), on the one hand, and impulse (*tên hormên*) and interference (*empodizon*), on the other. Something is necessary when it is forced to be the way it is. More specifically, in the case of artefacts, something might hinder the process (i.e. make it difficult), whereas in the case of natural beings, something interferes (i.e. gets in the way of a process that would normally take place).[64] In the case of natural generation, provided that there is no external interference, *to sperma* changes in virtue of its own principle and becomes potentially a living being.

Although the main criterion for a given matter to be potentially *F* is the same in both artificial and natural processes of coming-to-be, the natural matter is, in a way, both agent and patient, whereas the artificial matter is only patient and needs to be acted upon from the outside. Moreover, in artificial matter, there are indeed internal hindrances at every stage before that of proximate matter, which needs to be acted upon. In the matter of a living being there are no internal hindrances, but only external interferences.[65] Internal hindrances can be found far back, at the level of the elements, but the stage before proximate matter has no internal hindrances.[66] Natural matter as such is already functional,[67] whereas

[64] Indeed, the features of artefacts' matter displayed in H 4 are introduced with 'it can happen'.

[65] The author of *On Plants* explains that a plant will grow when the following conditions are fulfilled: (i) there is a definite seed, (ii) a suitable position, and (iii) a suitable supply of water and air (Book 6). One can refer this passage to our discussion by re-formulating it in this way: the definite seed is potentially a plant iff, provided that the position and the supply of water and air are provided, the seed will turn into a plant by a single actuality-inducing event like falling into the soil or being planted into it.

[66] This is clearest if we adopt the distinction between two stages from Δ 4 and H 4.

[67] It is certainly true that the menstrual fluid has not been menstrual fluid all along, as beforehand it must have been not only blood, but also nutrition. In the case of menstrual fluid, the cooking up of the blood is not sufficient to make it semen but it is enough for it not to be just any blood (see Connell 2016). However, from the perspective of the maker, there is no making the material ready, namely turning the blood or the food into menstrual fluid. From the perspective of the natural

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artificial matter needs to change to accommodate a function.[68] To the question of why there is a many-to-many relationship between the form and matter of artefacts, I shall therefore answer that their matter lacks a principle in virtue of which it would become first potentially and then actually a certain artefact, so that it is open with respect to the form it can acquire. This kind of matter is not essentially functional, because it is not essentially matter evolving in that specific object. By contrast, what it means to be menstrual fluid is to be potentially a living being. The essence of menstrual fluid is to turn into an embryo if nothing external interferes – and if the agent 'wills' it (i.e. if it is fertilised). It is in this sense that the diachronic matter is *sômatikê*, for it becomes synchronic matter by itself.

The result of this survey is that if the principle oriented towards the form in virtue of which some matter becomes first potentially and then actually a certain artefact is not *in* the diachronic matter, the form towards which the principle works is ultimately external to the synchronic matter as well. At this point, I shall connect the discussion on matter and Aristotle's account of art as external principle. We have already discussed *Phys.* 2.1,[69] but it is worth recalling a few points in this regard, particularly the main point, which is surely the externality of art, as principle, to the object. Here we come to understand that art is external to matter. Bricks and stones have their own nature, as displayed in their properties, and this nature does not correspond to the nature of the object as a whole, unless accidentally. Antiphon's example means that, in artefacts, the cause of the matter's being that thing is an accidental attribute of it:

> It seems that the nature and substance of a thing by nature is the primary constituent present in each thing, <something> unformed in itself; for instance, the nature of a couch would be the wood, of a statue the bronze. It is an indication of this, says Antiphon, that if one buries a couch, and the decomposition gets the ability to send up a shoot, a couch would not come-to-be but

philosopher too, there is no making the material ready if the object of inquiry is the embryo or the human being. Of course, things change if the primary object of inquiry is menstrual fluid as such and the natural philosopher is a specialised biologist.

[68] Certainly, death has to do with the matter and its weakened ability to hold the form. The presence of fewer hindrances in organic matter as well as of the agent-principle inside it does not make death impossible. The matter can still lose its bulk. Rather, Aristotle appears to take corruption to pertain particularly to living beings precisely because natural objects share their nature with their elements, which are in turn easily destructible. Such a case is contrasted with things that constitute a unity by composition of many things, such as the house (see *On Length and Shortness of Life* 1.2, 465a13–19). In this sense, my view departs from Loux's (1991) view, according to which the relation between matter and form in natural wholes is accidental given that it can be 'broken' in corruption. I return to this problem in the next chapter, especially in Section 7.3.4.

[69] See Chapters 3 and 5.

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> wood [would]; so that the disposition according to convention and the art belong only coincidentally, and that the substance is that which persists uninterruptedly while undergoing such affections. (*Phys.* 2.1, 193a9–17)

Certainly, Aristotle does not endorse the thesis that nature is primarily identifiable with matter, and, in fact, in what follows in *Phys.* 2.1, he identifies nature with form. However, this does not mean that he sees Antiphon's example as mistaken. Aristotle does agree that if something can come-to-be out of a couch it would be just the matter: the form and the matter are not essentially related to each other, and the presence of the latter does not imply the presence of the former. Antiphon's example is appropriate and consistent with the identification of nature with matter in artefacts. The targets of his criticism are those who infer from Antiphon's example that nature is always the material substrate: this is the case for artefacts, but not for living beings. In the case of living beings, the cause of the matter being a certain living being is an essential attribute of the matter itself. One must not always infer from the artificial case to the natural case. Indeed, if an artefact's form were an internal principle, like nature, it would be the agent in the matter, so that the matter would be essentially related to that particular artefact and there would be a one-to-one relationship between the diachronic matter and the object. However, this is not the case and the fact that, if one were to bury a couch (and if its decomposition were able to produce anything at all), what would come-to-be would be not a couch but rather wood, is a clear indication of the many-to-many relationship between matter and form. When matter and form are essentially related because the latter is in the former – or the principle for the latter is in the former – the matter brings the form with itself. An effective example is to be found in *Phys.* 2.8, 199b28–30, where Aristotle compares nature to the shipbuilding art – if the shipbuilding art were in the wood. Indeed, if the shipbuilding art were in the wood, the wood would necessarily be the matter for and of a ship, and it would be open to being the matter of a couch only accidentally. However, since the shipbuilding art is not in the wood, the wood is equally open to being the matter of a couch or of a ship, or even the matter of nothing at all. Were wood functional matter, it would bring about a couch through itself.

6.3 The Synchronic Matter of Artefacts: Functional Matter and the Homonymy Principle

In the case of natural substances, there is a one-to-one correspondence between matter and form, not because the diachronic matter is in-formed, but because, in itself, the matter is equipped with a principle that eventually

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leads it to the relevant form and completeness – without internal hindrances – and, in this way, it is functional. This state of affairs has repercussions for synchronic matter (i.e. the matter of which something is constituted), upon which I shall now focus. Diachronic and synchronic matter coincide in both cases, because in living beings they are both functional and *sômatika*, while in artefacts neither is functional and hence both are, so to speak, *lithina.* While the synchronic matter of living beings is essentially functional, the constitutive matter of artefacts is only accidentally functional. In the case of living beings, since form and matter are essentially related, the matter is essentially functional. I argue, however, that inquiring into the synchronic matter of living beings as constitutive and not functional is just as much of a conjecture as inquiring into the synchronic matter of artefacts as functional.

Let us first consider living beings. The homonymy thesis applies to the synchronic matter, and particularly to non-uniform parts of animals, such as the hand or the eye: they are defined by their functions, so that, once they are separated from the body, they are said to be 'hand' or 'eye' only equivocally. A separated hand is not, strictly speaking, a hand anymore, because it cannot perform the function of a hand. A hand is such only as long as it is part of a living body, because only within this system can it perform its function.[70] In the case of biological organisms, Aristotle applies the homonymy thesis to wholes, as well as to parts. The sense in which an eye is a functional part is stronger than the sense in which things such as tissues are functional, but the homonymy thesis nonetheless applies. Not only the body and its organs, but also flesh and bones are essentially functional. To speak of these organic parts without reference their function would ultimately be mere speculation.[71] The unity between synchronic matter and form must lead back to the unity between diachronic matter and form. Θ 7 has done great work separating out the natural case from the case of things possessing an external principle. The potential diachronic matter of a human being will turn into a human being by itself (so long as nothing external interferes). Diachronic and synchronic matter are the same because both are essentially functional. The one-to-one relation between form and diachronic matter in living beings is shown by the fact that some matter can serve as the matter of only one thing, while that one thing, for instance a man, comes-to-be only out of that one matter.

[70] See *PA* 1.1, 640b34–641a3, a18–21; *Met.* Z 10, 1035b11, 24 and Z 11, 1036b30–2; *DA* 2.1, 412b20–2.

[71] The only way in which one can talk about the synchronic matter of a living being without reference to its function is to focus on the elements, but the elements are a subdivision of diachronic matter, not synchronic matter.

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However, the relation between matter and form is essential if the focus is on synchronic matter, which comes into play as soon as the form is imposed.

In the case of artefacts, there is an intuitive sense in which the synchronic matter is, for example, *lithinê.* The externality of art as a principle means that the matter of artefacts is and remains relatively independent of the object itself. One result of this is that the matter and parts of artefacts can be reused once they are taken away from the whole. There is, however, also a more philosophical explanation for this. A separated eye ceases to be an eye and does not ever have the chance to become an eye again. By contrast, a separated stone does not cease to be a stone; hence, it can be a stone without being the matter of anything or it can be reused as the matter for another artefact.[72] Living bodies are essentially ensouled. The iron, on the other hand, is not essentially the knife. In what follows, I will show that to speak of the synchronic matter of artefacts as functional is ultimately a conjecture from the standpoint of metaphysics, because the homonymy principle only strictly applies to living beings. This conjecture remains, however, a useful device for the natural philosopher and the maker or user of the artefact.

To be sure, since all materials, such as bronze and stone, have properties that make them suitable for certain products, the raw material can also in a way be regarded as quasi-functional. Moreover, a functional description can be offered and not only of living beings, since all things that come-to-be with an end (i.e. natural as well as artificial beings) can be described in functional terms. Aristotle evidently believes that we can provide a functional description of artefacts too, and that forms of artefacts are specifiable as functions. However, I argue that although a functional account applies to both living and artificial beings, the homonymy thesis strictly applies only to entities in which matter and form are essentially related to each other. I will now try briefly to answer the following questions:

i. Does Aristotle provide a functional account of artefacts?
ii. Does Aristotle provide a functional account of parts of artefacts?
iii. Is the homonymy thesis applied to artefacts at all?

[72] The possibility of a second utilisation of the matter of artefacts is explicitly mentioned in *Problems*, XXX 8, 956b3–5: each product is managed by only one art (e.g. health is the exclusive domain of medicine). The only exception to this rule is when one art makes a whole (new artefact) out of a part of an already given artefact. The example is the cobbler's art making a shoe out of the front part of a shoe.

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In regard to (i), Aristotle provides a functional description of artificial objects, as I have shown in more detail in Section 6.1. First, hypothetical necessity is an instance of a functional consideration, since it concerns the relation between the matter and the object insofar as it has a certain function. Moreover, forms of artefacts are specifiable as functions. For instance, the definition of a house is stones, bricks and timbers (matter) for the sake of sheltering (form).[73] Especially in the case of more structured and complex artefacts, Aristotle allows for a functional account of their forms. In order to provide a functional description of a house, one would need to mention the form of the house and identify it with its function (i.e. protection or sheltering). As we will see in the final chapter, a functional account of artefacts is the chief interest of the maker, the user, and the natural scientist.

In response to (ii), a functional account is also possible in the case of artificial parts and is again typical of the perspective of the physicist and the artisan.[74] A part of a house can be identified with its foundations, a part of a ship with the keel[75] or again a part of a cup with its handle.[76] In the middle books of the *Metaphysics*, what Aristotle indicates as the matter of a house is mostly bricks and stones, with no mention of foundations, but elsewhere (and, hence, in different contexts) he mentions foundations. Let us thus consider the foundations as a material part of the house. As soon as a functional description is introduced, the relation between matter and form appears to be one-to-one. This is clear from the occurrences in which he states that what is prior to a house are its foundations. In *GC* 2.11, 337b15–31, what is prior to a house are the foundations, and, in turn, what is prior to the foundations is the clay. In a sense, Aristotle refers to the compositional matter (clay), but also to the following, more functional stage (foundations). In the *Physics*, he mentions as the matter of a house either stones, earth, timbers and foundations (2.9, 200a4) or simply foundations alone (6.6, 237b13). Aristotle mentions foundations mostly in the *Physics*, when he discusses hypothetical necessity. In *GC*, too, the context is hypothetical necessity.[77]

[73] See also *DA* 1.1, 403b3–5.

[74] The mention of 'parts' is not a new element in the discussion. The focus itself on the synchronic and therefore more functional matter favours the treatment of matter as parts.

[75] See *Met.* Δ 1. [76] See *Met.* Δ 27.

[77] As has been said, in the middle books of the *Metaphysics*, Aristotle mentions bricks, stones and timbers as the matter of a house. The usage of artificial examples has a completely different purpose than the one employed when discussing the principle of hypothetical necessity. Especially in the metaphysical passages we have discussed, Aristotle is dealing with artefacts with the aim of

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One could argue that it is appropriate to speak of functional matter in artefacts by stressing that certain parts are necessary for the artefact to be what it is. Δ 27 seems to go in this direction. The chapter investigates the notion of mutilation (*kolobon*). Subjects of mutilation are mostly wholes and parts, and mutilation occurs when something is taken away, but the substance still remains. Furthermore, mutilation occurs only when the object is a whole structured by its form and is continuous. A continuous whole is said to be mutilated when the part that is taken away is not a fundamental part (*ou gar dei oute ta kuria tês ousias* at 1024a23–4). The mention of a 'fundamental part' is what more strongly suggests the existence of functional parts. Aristotle explains that a cup in which the handle or some extremity has been removed is mutilated: in this case, the part that has been taken away is not a fundamental one (though it is still a functional one). However, if a hole has been drilled in the cup, the cup has not been mutilated: in fact, the substance of the cup does not remain. If the cup is supposed to be, for instance, clay for the sake of drinking, once it has a hole, it cannot perform its function and hence it loses its form.[78]

Finally, in relation to (iii), according to the homonymy thesis, a certain 'final object' is such when it can perform its functions: if and when an object cannot perform its functions, it is called 'that thing' only equivocally. In *PA* 1.1, 641a1–3, Aristotle criticises Democritus for reducing the essence of a being to the shape of its structure: a corpse looks like a man, but to be a man is more than to merely have the appearance of man, since it requires being capable of exercising certain functions. For instance, in *Meteor.* 4.12, 389b31–390a1, Aristotle compares a corpse, which is said to be a man only homonymously, and a corpse's hand, which is said to be a hand only homonymously, to a flute made of stone, which is, in turn, called 'flute' only homonymously because it cannot perform its function. As Frey (2016, 176) clarifies, the homonymy thesis concerns only terminal malfunction, as opposed to local malfunction. The former occurs either

describing the peculiarity of the artificial case and the relation between matter and form in this kind of objects. By contrast, in the *Physics*, the purpose is to explain certain principles concerning natural beings, thus the case of artefacts is introduced in order to exemplify those principles. It is not trivial to note that the *Physics* is about natural things, and that artefacts do not fall under this class of beings. If the focus is on matter and its relation to form (which is the case in *Met.* H), one must be precise in this regard and indicate the proper matter. Aristotle needs to keep matter and form separate if he wants to make both them and their relationship intelligible. In the case of a house, the matter is bricks and stones, and not the foundations: since the parts and the matter are not informed, the foundations are not a candidate for being matter at all. On this, see the Introduction.

[78] These functional parts are comparable to the simultaneous parts of human beings (i.e. simultaneous to the existence of the human being, like the heart or the brain). See *Met.* Z 10, 1035b25–7.

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when an organism perishes or when an organ ceases to function because the organism ceases to be. By contrast, the latter occurs when the organ ceases to function or does not function properly, but the organism is still alive and functioning. The distinction between local and terminal malfunctions is relevant because the case of artefacts and that of living beings seem to differ only with respect to the latter. Local malfunctioning can occur equally in both cases: an eye can malfunction as a result of a localised disease and a handle can malfunction because it is broken. By contrast, terminal malfunctioning occurs only in living beings. Let us consider the case of a knife: it is composed of the blade and the grip. The blade might cease to function if, for instance, it is no longer sharp (local malfunction), but if the knife itself is destroyed in such a way that the blade is preserved,[79] the blade does not cease to be able to cut. If it is, in fact, terminal malfunctioning that justifies the application of the homonymy thesis, does this principle hold at all for artefacts? In general, it seems to apply to artificial wholes: a saw is such when it can cut, so that neither a wooden saw nor a painted saw is really a saw. A 'flute' made of stone might look like a flute, but to be a flute is more than merely to look like a flute, for it involves being capable to produce certain sounds. However, I shall argue that the homonymy thesis is not applied in a strong sense to artefacts and that certain Aristotelian examples either (i) are not meant to be examples of artefacts or (ii) are not intended to defend the homonymy thesis for artefacts too. As for the first point, there are some examples that are usually interpreted as referring to artefacts, but that in fact refer to natural substances, for instance when Aristotle speaks of hands made of stone,[80] wood or bronze,[81] or again when he speaks of eyes made of stone,[82] and flesh made of stone or wood.[83] In all of these cases, he applies the homonymy thesis. However, one ought not to consider the hand made of bronze to be an artefact, just because it is not a natural thing. These cases are analogous to that of the corpse: they are parts of living beings that look like hands or eyes (i.e. natural parts), but that are inanimate. To say that an eye or a hand is made of stone is not to say that the eye and the hand are artefacts. The point is rather to consider natural parts in a dead (or non-living) body. As for the second point, I contend that, when Aristotle applies the homonymy thesis to artefacts, either his arguments are based on the hypothesis that they are living beings,

[79] Surely, if the knife is melted down, its parts cease to be. However, this is not the way in which Aristotle talks about the organic parts when the organism perishes. In the homonymy thesis, he rather considers the cases in which the parts are still present, but no longer function.
[80] *Pol.* 1.2, 125a19–25. [81] *PA* 1.1, 640b34–641a34. [82] *DA* 2.1, 412b21–3.
[83] *GA* 2.1, 734b24–7.

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such that they do not really concern artefacts, or they are meant to merely exemplify the homonymy thesis as it applies to living beings. In *DA* 2.1, 412b12–15, for example, he applies the homonymy thesis to an axe: once its ability to cut has somehow been taken away, the item ceases to have the essence and the definition of a real axe. However, he also says that the homonymy thesis would hold *if* the axe 'were an animal'.[84] Since the axe is not an animal, the homonymy thesis, ultimately, does not hold. The case of the stony flute found in *Meteor.* 4.12 appears to be a comparison made to clarify in what way the homonymy thesis applies to the corpse and the corpse's hand. Furthermore, nowhere does he apply the homonymy principle to parts of artefacts. This fact is of considerable significance. Although Aristotle sometimes provides a functional description of parts of artefacts, he does not relate them to the homonymy principle. Although the functional matter depends on the compositional matter,[85] the parts of living beings are not just what the latter are composed of, but they are something more, because they have a function and a form within and belonging to the whole. The application of the homonymy thesis draws a line between accidentally functional matter (that of artefacts) and essentially functional matter (that of living beings). In the case of a knife, the functional matter consists of its parts, such as the blade and the grip, while the compositional matter would be the iron, as the material of which the knife is constituted. Compositional and functional matter are different types of objects: the blade is made of iron, but iron does not need to be a blade. As concrete 'stuffs', compositional and functional matter are the same thing: that portion of iron is indeed the blade, and the blade is that portion of iron. The homonymy thesis does not hold here, because the reason why the iron is a blade lies outside the knife and, in this sense, the synchronic matter is only accidentally functional. By contrast, in living beings, the homonymy thesis holds precisely because the reason why the matter is, for instance, a given organ lies inside the matter.

The reason why Aristotle mentions bricks and stones more often than foundations as the synchronic matter of a house might also have to do with the fact that the homonymy thesis does not apply to artefacts. By contrast, in the case of living beings, the synchronic matter is essentially functional and therefore related per se to the form. The strong unity between synchronic matter and form (shown by the application of the homonymy

[84] See Frey 2006, 178–9.

[85] On the dependence of the functional matter on the properties of the structural or compositional matter in performing its functions, see Furth 1988, 52; Byrne 2012.

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thesis) and the exclusive relationship between diachronic matter and form are marks of natural substances. However, as I explain in Section 6.5, they are not yet the immediate reason why paradigmatic substances are what they are.

6.4 What Then? Persisting Matter

The discussion of diachronic matter will not be complete without a discussion of destruction. More important, the case of destruction puts the whole theory to the test. We have so far dealt with diachronic matter as pre-existing matter, but diachronic matter is also persisting matter. The proximate matter is potentially the object (i.e. the matter that is one actuality-inducing action away from being the object). By contrast, the persisting matter is what persists after an actuality-withdrawing action. Granted that persisting matter is still diachronic matter, the question that draws a sharp opposition between artefacts and natural beings is that of the nature of what persists. The persisting matter should be the same as the proximate matter in artefacts, but different from it in natural beings – if it is true that an actuality-withdrawing action takes away the form and the principle oriented towards it altogether. And, in fact, in artefacts, the persisting matter coincides with the proximate matter, whereas in natural beings it does not. The proximate matter of a house is bricks and stones, which are one actuality-inducing action – in principle, composition – away from being the first parts of a house and then a whole house. Let us now imagine ourselves performing an actuality-withdrawing action – for instance, decomposition. What remains will be bricks and stones; that is, something that is already the proximate matter for something else or otherwise ready to be made into something. After all, if the form is not in the matter, and someone were to take the form away, the matter would be left unaltered. This is why one could immediately perform an actuality-inducing action on the persisting matter. The actuality-withdrawing action takes away the form, but not what makes the matter potentially a house. This does not contradict the view that the remote matter is the matter into which a thing is decomposed – as stated in H 4, since this is the case only with natural beings. When Aristotle describes the remote matter as the matter into which something is destroyed, he significantly picks natural examples. H 5 states that things that change into one another like day into night must revert to their matter:[86] 'If a live

[86] For an analysis of this passage, see Code's (2011) invited lecture *Aristotle on the Matter of Corpses in Metaphysics H 5*.

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animal were to come-to-be from a corpse, the corpse would have to first revert to its matter, and then in this way become an animal, and the vinegar would have to revert to water and then in this way become wine' (H 5, 1045a4–6). The persisting matter (i.e. the corpse) is not potentially a living animal. This means that the persisting matter here is not proximate matter. In order for the persisting matter to become the proximate matter for something it needs to revert to previous stages of matter. After an actuality-withdrawing event, the live animal does not transform into menstrual fluid (or anything analogous to it), until it has first reverted back to a more remote stage of matter. The same principle applies to wine.[87] The persisting matter of wine (i.e. spoilt wine) is not potentially vinegar or the proximate matter for vinegar. In order for the spoilt wine to be the proximate matter for vinegar it needs to revert to its remote matter (i.e. water). Artefacts present us with a different scenario from what we find in organic beings. Their persisting matter is potentially something else. This difference between natural and artificial persisting matter is not an isolated fact but connects with the features of proximate matter that we have enumerated thus far. In the case of natural substances, the principle oriented towards the form and therefore the form are in the matter. Hence, there is no taking away the form without also taking away the principle oriented towards it. So, for the persisting matter to be something else potentially, it must be situated a further step back, at a stage where there is no form and no principle either. The corpse represents this stage: it requires further reworking before it can become the proximate matter for a new living being. In the more straightforward case of wine, the reworking merely needs to turn the wine back to water. While in the case of artefacts, it is possible to reverse the process in just one step (i.e. by performing an actuality-inducing action on the persisting matter), in the case of natural beings this is not possible. The process cannot be reversed in just one step, because the persisting matter has lost the principle oriented towards the form together with the form. Several steps are therefore needed to get the matter back into a condition in which it is the proximate matter of or potentially is something else, or it is *sômatikê* again.

6.5 The Unity of Matter and Form and Substantiality

The matter and the principle in virtue of which the matter is a given artefact are two separate things and, unlike natural matter, the matter of artefacts is not already equipped with a principle oriented towards the

[87] Both wine and vinegar are natural beings, as all homoiomerous beings. See Chapter 3 (Section 3.4.2).

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form, but it is filled with potential hindrances. The fact that matter does not contain the principle is related to the fact that the form of artefacts comes from without. Since art is not an inner principle, the synchronic matter of artefacts is not in-formed by this principle: the matter remains relatively independent of the object even once the object has come into existence. By contrast, nature is an internal principle, and, in this case, the matter is therefore essentially related to the form. The diachronic matter of a human being can only be the human *katamênia*, and the human *katamênia* cannot be the matter out of which something different from a human being comes into existence. The diachronic matter of a living being relates one-to-one to that particular living being. Diachronic matter is indeed matter considered insofar as the object had not yet come-to-be, namely insofar as the matter is not yet related to the form. Even when form and matter are thought of as not yet being together, the matter of a living being is still bound to be the matter of that particular living being – in this sense it is functional and *sômatikê*. More obviously, the same applies to synchronic matter (i.e. matter considered as already related to a certain form). In the case of diachronic matter, its relationship to the form is one-to-one; in the case of synchronic matter, its relationship to the form is essential. The synchronic matter of living beings is functional. It has been shown that Aristotle provides a functional account of artefacts and their parts, such that the distinction at issue can be applied in this case. The principle of hypothetical necessity is, indeed, applied indifferently to artefacts and living beings, and this means that we can give a teleological description of these objects. However, although hypothetical necessity, not to mention a general functional account, can apply to artefacts, there is another principle that does not genuinely apply to artefacts: the homonymy thesis. The homonymy thesis is also evoked in a functional and teleological context but applies only to living beings. What is the upshot of these considerations? Although artefacts are teleological objects and their forms are functions, the non-application of the homonymy thesis to the synchronic matter signifies that the matter is not essentially functional (and, hence, essentially related to the form): this fact must be connected to the relationship between form and diachronic matter. Stones, considered as the diachronic matter of a house, have a many-to-many relation to the house. Stones, considered as the synchronic matter of a house, are not essentially related to the form of a house – and in this sense they are *lithinê*. One could say that when talking about the synchronic matter of a house, it is better to mention the foundations. However, the non-applicability of the homonymy thesis implies that the synchronic matter is accidentally

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functional, but not essentially functional. Since the synchronic matter is not essentially functional, bricks are not essentially foundations, but rather bricks. Thus, the appropriate synchronic matter of a house comprises bricks and stones. The synchronic matter of artefacts is not functional and, in fact, will survive as such even through corruption.

The focus on the unity between matter and form in artefacts allows us to draw a number of conclusions, but still leaves unclear the degree of substantiality of artefacts. Some scholars have argued that artefacts are not paradigmatic substances, because of the nature of the relationship between their matter and form.[88] Adopting a scalar view of substantiality, according to which living beings are paradigmatic substances, while artefacts are also substances, but not to the same degree, they argue that the decisive factor is the accidental relationship between form and matter. Although I endorse the claim that the relationship between matter and form in artefacts is not a necessary one, I do not quite see how the lesser degree of substantiality in artefacts results directly from the unity of matter and form. Both artificial and natural beings end up having matter as well as form, inviting further discussion about the way in which the unity of matter and form plays a role in determining the substantiality of artefacts. Is the fact that the form is not essentially related to the matter all that there is to say about the substantiality of artefacts? I do not think so. Unity is certainly a mark of substances: definition concerns only substances and substances are one, because being something determinate is being something unitary. However, Aristotle does not provide any criterion of substantiality stating that substances in a true sense exhibit a necessary relation between form and matter. Furthermore, it is unclear whether having form and matter be necessarily related makes the natural being a substance or a paradigmatic substance. In other words, even if we accept – as we should – that the relationship between matter and form in artefacts is accidental, this does not seem to guide us towards a binary or scalar view of substantiality. Scholars who emphasise that artefacts differ from living beings in that the relation of matter and form is accidental endorse a scalar view of substantiality, but it is nowhere clear that this relation makes artefacts substances to a *lesser* degree rather than not substances *at all*.

In the next chapter, I shall show that in order to grasp the immediate reason why artefacts do not enjoy the same degree of substantiality as living beings – or do not enjoy substantiality at all – we must assume the

[88] Koslicki 1997; Furth 1988.

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perspective of the metaphysician. This perspective focuses on the relationship between matter and form as parts and whole.[89] It depends on the conclusion that the form is not in the matter, while still being inherent in the object. Moreover, I argue that adopting this perspective also has an advantage that the mere discussion of the relationship between matter and form lacks: it does justice to other kinds of things, such as heaps and scattered objects, that need to be distinguished from artefacts in order to better situate the latter in Aristotle's ontology.

[89] Which means within a strictly synchronic framework. Parts are, in fact, already synchronic matter.

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