CHAPTER 4

Artefacts as Hylomorphic Compounds

This chapter argues that those material objects that, in the *Categories*, would fall under the category of substance qualify as hylomorphic compounds (i.e. they have matter and form). The view that artefacts possess their own forms is controversial. Indeed, the presence of a form in artefacts is denied by supporters of both the binary and the scalar view. For instance, according to Shields (2008), artefacts are nothing but heaps (i.e. only bunches of matter). A similar, but different position is articulated by Kosman (2013) and Morel (2015, 2017), according to whom forms of artefacts are nothing but accidental attributes of a certain matter, such that artefacts are most rightly identified as accidental beings. In this chapter, I shall challenge both of these views by presenting three arguments in defence of the thesis that artefacts have forms. The first argument is that artefacts undergo genuine unqualified coming-to-be, as opposed to the mere acquisition of a property by a substrate. Related to this argument is the crucial Aristotelian distinction between per se unity and accidental unity. Artificial continuous objects are different from and opposed to the accidental unities displayed by things such as Socrates-being-white. The second argument is based on Aristotle's application of the *ekeininon*-rule to artefacts, which reveals that the identity of an artificial object cannot be reduced to its matter. The third argument is that Aristotle's application of the synonymy principle to artefacts shows that the form in the mind of the artisan is identical to the form present in the actual artefact, insofar as it is thought, and that the artisan's use of tools represents the stage at which the artefact's form is in potentiality.

The ascription of forms to artefacts is, in different ways, derived from Plato. Aristotle himself employs the case of forms of artefacts against Plato's theory of Ideas. Plato's denial of the existence of separate forms of artefacts, a problem he does not discuss in detail, is shown to be contradictory or at least problematic. It is plausible that Aristotle did not want to run the same risk (i.e. of having artefacts used as counterexamples or in

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counterarguments). He therefore acknowledges and accepts that artefacts have forms. He does so by providing a theory of substantial forms which accommodates artefacts too. The philosophical challenge raised in the *Parmenides* of what things have separate forms is inherited and confronted by Aristotle on his own terms. The metaphysical problem is thus formulated in terms of the question: What things have forms? Not only does Aristotle translate the question into his own terminology, but he is also careful not to forget about artefacts, unlike the *Parmenides*. Faced with the question of what things have forms, the case of artefacts ought to be considered too, because artefacts have been shown to be potential threats. Thus, Plato elaborates an important metaphysical problem and Aristotle builds on it by proposing a theory of forms that includes artefacts too. Moreover, the ways in which Aristotle provides arguments for the existence of forms of artefacts is through the ascription of unqualified coming-to-be to artefacts and the persistent and serious application of the synonymy principle to the case of artefacts.

4.1 Artefacts Undergo Unqualified Coming-to-Be

4.1.1 Intrinsic Change in the Matter

In the first book of the *Physics*, Aristotle has not yet identified the items with which physics as a discipline is concerned. The reader/listener does not yet know either what nature is or what the features of natural beings are. For our purposes, this also means that Aristotle has not yet argued for the exclusion of artefacts from his discussion. *Phys.* 1.7 illustrates the coming-to-be of several artefacts. However, the processes through which these artefacts come-to-be can be described as alterations, or, let us say, as qualified comings-to-be, rather than as instances of generation in the proper sense. On the one hand, if the production of artefacts is merely an alteration of some matter, artefacts will not be hylomorphic compounds but either accidental compounds or even just matter. On the other hand, if the coming-to-be of artefacts is to be regarded as an instance of unqualified coming-to-be, then artefacts will be hylomorphic compounds. Aristotle ascribes unqualified coming-to-be to artefacts, and this change consists in the performance of an alteration of some matter with a view to a specific form. Significantly, the ascription of unqualified coming-to-be to artefacts entails that artefacts have forms (i.e. that they are hylomorphic compounds).

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In *Phys.* 1.7, Aristotle begins by clearly introducing artificial production as an unqualified coming-to-be, referring to 'things that come-to-be unqualifiedly' (*ta gignomena haplôs*) in relation to statues and houses. An unqualified coming-to-be is the coming-to-be of a substance as opposed to the coming-to-be *something*. The former is an instance of generation in the proper sense, whereas the latter is the acquisition of a property, such as a quality or quantity, by a substrate. Generation is opposed to qualified coming-to-be. An artefact's coming-to-be is classed together with reproduction in living beings, in which the outcome is a new substance and not simply a substrate having undergone a change in property. Unqualified and qualified comings-to-be have in common the fact that there must be an underlying thing out of which the product is generated. In the case of qualified coming-to-be, such as Socrates becoming musical, that there is a pre-existing thing underlying the change (i.e. Socrates) is obvious; in the case of unqualified coming-to-be, by contrast, the need for such a pre-existing thing becomes clear only once 'you look attentively' (190b1–3). Thus, Aristotle refers to the more straightforward example of artefacts:

> There is always something which underlies, out of which the thing comes-to-be, for instance plants and animals out of seed. The things which come-to-be unqualifiedly do so some by change of shape, like a statue, some by addition, like things which grow, some by subtraction, as a Hermes out of the stone, some by composition, like a house, some by alteration, like things which change in respect of their matter. All things which come-to-be in this way plainly come-to-be out of underlying things. (*Phys.* 1.7, 190b3–10)

It is not a simple task to grasp why Socrates becoming musical and a stone becoming shaped are two different cases. Nonetheless, Aristotle clearly regards the case of a Hermes coming-to-be out of a piece of stone as an unqualified coming-to-be, as opposed to the qualified coming-to-be found in the case of Socrates learning music. Where, exactly, is the difference? It is plausible that Aristotle employs examples of artefacts because they illustrate more clearly that there is also something pre-existing in unqualified coming-to-be.[1] The case of the seed in the coming-to-be of a living being is briefly mentioned, but is

[1] Even though the case of artefacts seems to be more convenient for the sake of explanation, Aristotle is aware that it blurs the distinction between generation and alteration: the problem is, in fact, addressed in *GC* 1.4, 319b21–31. Despite the ongoing debate, I believe that *Phys.* 1.7 and *GC* 1.4 are not in contradiction, since I take the former to argue that, in a simple coming-to-be, the substrate must change, but nonetheless persist, and the latter to argue that, in a simple coming-to-be, the substrate changes and is not perceivable *as a whole*. For the debate about the persistence issue, see Code 1976; Williams 1982; Gill 1989. For the traditional view, Charlton 1970; Jones 1974. For the anti-traditionalist view opposing the persistence of the substrate, see Broadie 2004. For my part, I think that the account of generation of *GC* also accommodates artefacts.

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perhaps not sufficiently clear since the seed is less visibly present in the offspring.[2] One might argue that *Phys.* 1.7 is primarily interested in various types of changes and merely uses artefacts to help to explain unqualified coming-to-be. Yet, it would be odd to refer to a qualified coming-to-be to illustrate the way in which unqualified coming-to-be differs from qualified coming-to-be.[3] Furthermore, in *Phys.* 7.3, Aristotle states that it would be absurd (*atopon*) 'to say of a man or house or anything else that has come into existence as having been altered' (*Phys.* 7.3, 246a4–6). A house is generated but not altered to the same extent as a man.

In qualified coming-to-be, the feature that changes must be one that ceases to be at the end of the process. For instance, 'non-musical' is that property that ceases to be when 'musical' comes-to-be present, with the change occurring between $stage_1$, in which Socrates does not know music, and $stage_2$, in which Socrates does know music. By contrast, in an unqualified coming-to-be, that which changes (i.e. the substrate) must also be present in the final product. The stone out of which Hermes comes-to-be does change, but it is still present in the statue that is produced. Aristotle does not regard this as alteration, but rather as an instance of generation through subtraction. Subtraction itself, like other processes, is an alteration, but that which comes into being is not altered; rather, the matter being altered gives rise to a coming-to-be (246a6–9). All unqualified comings-to-be are connected to, but not reducible to, other kinds of changes. Let us now consider more carefully Aristotle's list of alterations through which new objects come-to-be. *Phys.* 1.7 has been mostly mentioned within the debate concerning prime matter. To my knowledge, there have not been modern attempts to address such instances of coming-to-be in their own right. Here is a tentative list of the various processes through which coming-to-be might occur: shape-change (*metaschêmatisis*), addition (*prosthesis*), subtraction (*aphaeresis*), composition (*sunthesis*) and alteration (*alloiôsis*).[4] I will present my analysis with reference to a passage

[2] For a detailed analysis of biological generation as unqualified coming-to-be, see Henry 2019.

[3] I am expressing here the same thought as Simplicius: 'And how could it be reasonable for Aristotle, after having taken care of the other kinds of coming-to-be, to return to them again?' (*in Phys.* 213,30). And again at 213,35, he concludes 'so perhaps here too by "things which come-to-be without qualification" Aristotle means things which come-to-be in the strict sense and with respect to substance' (translation by Mueller in Baltussen et al. 2012).

[4] Ross (1936) groups together shape-change, addition, subtraction, composition and alteration in that the corresponding things undergo change only in virtue of certain local movements of their materials and opposes to these cases the case of things that 'change in respect of their matter' (*ta trepomena kata tên hulên*). In general, it is difficult to think of change of shape as the mere local movement of matter. More specifically, however, things that change in respect of their matter seem to be rather examples related to things that come-to-be by alteration. The passage consistently presents a list of qualified comings-to-be

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from *Met.* H 2 enumerating similar cases. H 2 offers a list of the various *differentiae* predicated of matter in which several examples of artefacts figure. The *differentiae,* such as, for instance, composition, coincide with coming-to-be only to a certain extent, since they shift the focus from coming-to-be to being.[5] It is, however, important to bear in mind that *Met.* H 2 does not concern itself with things that come-to-be unqualifiedly, but only with the ways in which things differ from one another. This means that it does not establish which cases are cases of proper unqualified coming-to-be but only by which actuality things are demarcated from everything else. As we shall see, only in the case of unqualified comings-to-be do such *differentiae* also indicate by which change a certain thing came into existence.

i. Shape-change is the means by which a statue comes-to-be. Depending on the way in which a piece of wax is shaped, either a cube or a sphere comes-to-be. The change in the shape of wax corresponds to the coming-to-be of the statue. The difference between the wax (mere matter) and the statue is accounted for by the process of shape-change undergone by the matter, according to the specific shape the sculptor wishes to realise. The statue undergoes unqualified coming-to-be because the matter has been altered in a certain way.[6]
ii. Aristotle refers the process of addition to the coming-to-be of things that grow (*ta auxanomena*). The case of *prosthesis* is problematic precisely because of the reference to 'things that grow'.[7] Growth is, indeed, not an unqualified coming-to-be. However, there must be a sense in which addition is not only a mode of growth, such as in the case of nourishment, but also of coming-to-be. Things that grow are usually living beings, but they do not come-to-be through addition. One might say that living beings come-to-be out of a seed through addition: perhaps through the addition of the semen to the *katamênia*. However, Aristotle does not describe the generation of animals in terms of addition. The semen is not simply added to the

through which certain things come into existence followed by the corresponding examples. For the assimilation of such changes to local change in medieval authors, see Majcherek 2022.

[5] See Chapter 7 (Section 7.1).

[6] Shape-change can also be the means by which an inadvertently made seat comes-to-be, see Chapter 3 (Section 3.4.1).

[7] Aristotle speaks about things that grow in *GC* and refers the term to the elements (*GC* 2.6, 333b2–3). He further states that 'it is not by addition that growing things are believed to increase'. It is not by addition that fire increases, but is it by addition that the fire comes-to-be? The answer is negative. In *Cat.* 15a29, Aristotle states that an example of things that grow and are not altered is the square when the gnomon is applied. I find it hard to believe that, in *Phys.* 1.7, Aristotle has this example in mind.

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menstrual fluid, but rather acts on it like rennet on milk.[8] The expression 'things that grow' is mostly used in *HA*, where it is clear that Aristotle is using it to refer to living beings, but there is a specific subset of these things that come-to-be by addition, in the sense of nutrition or change with respect to quantity. Examples of these include bees, drones, ants that come-to-be from grubs and animals that come-to-be from eggs. In a way, the case of plants could be accommodated here too. One can conceive of the seed as undergoing addition and the plant as coming-to-be by imagining water being added (addition) to a seed (matter) in such a way as to generate a plant. The only problem with this interpretation is that it is unclear how the case of addition is any different from the case of composition. In fact, in both cases heterogenous materials are added to each other. The difference between addition and composition is therefore that, in the case of addition, there is something that grows and something that is added to it. Usually, the thing that grows is a substance and the thing that is added is nutrition. By contrast, in the case of composition, these roles cannot be distinguished – for it is not the case that one thing grows and another nourishes it.[9]

iii. Subtraction raises several concerns. Is subtraction meant to be a version of shape-change? Is subtraction simply complementary to addition? Subtraction, Aristotle suggests, is the mean by which a Hermes comes-to-be. Suppose an artisan has a block of stone; the production then involves a series of subtractions by means of which it receives the shape of Hermes. To understand the difference between subtraction and shape-change, let us imagine a malleable material.

[8] *GA* 2.4, 739b21–7. This comparison with the case of food might be an alternative: food can indeed be said to grow. An interesting example might be the following: bread is something which needs to grow (to rise) and it comes-to-be through the addition of several elements. However, this case does not seem to differ from the case of composition (iv) in any significant way. Additionally, in *Met.* H 2, the case of food (I am referring to honey-water in 1042b15–16) is categorised within the class of things whose *differentia* is the composition of their matter (*sunthesei tês hulês*).

[9] This reminds us of Plato's *Phaedo* 96C–D, where Socrates introduces the nutrition of a human being as an example of something about which he was sure but came to 'unlearn'. The problem raised by this passage is whether the food accrues to the flesh or the other way around. According to Shields (2008), the solution of this puzzle depends upon the presence of intrinsic ends, such that the thing that grows is the thing possessing intrinsic (and not conventional) ends. Now, from this, Shields infers that only living beings possess intrinsic ends (148) and are therefore substances. If, however, addition in the case of living beings is only one of the ways in which something can undergo unqualified coming-to-be and intrinsic ends can also be ascribed to artefacts on the basis of the art-nature analogy, it seems that something can acquire a substantial form and have intrinsic ends without being a living organism. Moreover, as we will see later on, the presence of intrinsic ends and a substantial form do not coincide with being a substance – even if all substances are living beings.

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One could roll it in such a way as to make it round: a sphere could thus come-to-be through a change of shape. One could also have too much material and subtract some of it from the block. In this way, subtraction is similar to change of shape in that the underlying matter is a homogeneous material. By contrast, subtraction might or might not be complementary to addition: as we have seen, in the case of things that grow, the process involves heterogeneous materials, whereas subtraction seems to primarily involve homogenous material. The addition of homogenous materials is in principle possible, but we must then distinguish between this addition (which is complementary to subtraction) and biological addition (ii).

iv. The coming-to-be of a house is due to composition (*sunthesis*).[10] The composition of bricks, stones and timbers in the right way produces a house.[11] Aristotle regards *sunthesis* as a possible *differentia* in *Met.* H 2.[12] Composition is the act of putting together heterogeneous materials. Composition itself may further be divided into kinds, such as those listed in *Met.* H 2, 1042b15–19. There, Aristotle argues that some things are said to differ through the composition of their matter (*ta men sunthesei tês hulês*) using the following examples: honey-water by blending (*krasei*), a bundle by tying (*desmôi*), a book by gluing (*kollêi*) and a casket by nailing (*gomphôi*). All such kinds of composition require heterogeneous materials. In this regard, composition differs from addition, but not from biological addition.

v. Alteration is frequently opposed to coming-to-be in that it is a qualified coming-to-be. In *Phys.* 1.7, it is presented as a qualified coming-to-be on which an unqualified coming-to-be supervenes and concerns 'things which change in respect of their matter'. Aristotle intends to address those cases in which the change of matter is not a mere alteration but produces a new substance. Ice is a possible example of this: in *Met.* H 2, Aristotle defines ice as 'water frozen or solidified in such and such a way'. The alteration of water, in this case its solidification, is not merely a qualified coming-to-be that happens to water, but an unqualified coming-to-be that happens to ice. The alteration as such brings ice into existence. In *Met.* H 2, 1042b22, Aristotle states that some things are said to differ by virtue of the

[10] See also *Top.* 150a19.

[11] *Phys.* 1.4, 188b17–21: 'A house comes-to-be from certain things in a certain state of separation instead of conjunction, a statue (or any other thing that has been shaped) from shapelessness – each of these things is partly order and partly composition.'

[12] See Chapter 7 (Section 7.1).

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affections proper to perceptible things (*ta de tois tôs aisthêtôn pathesin*), such as hardness and softness, denseness and rarity, and dryness and wetness. In *GC* 1.4, 319b16, water becoming air is presented as a coming-to-be. In *GC* 1.5, 321a15-17, Aristotle clearly states that the change of water into air is not growth (i.e. a qualified coming-to-be, but that it constitutes the ceasing-to-be of water and the coming-to-be of air).

In all of these cases, there is something that pre-exists the simple coming-to-be underlying the production, that is, a substrate that, after the coming-to-be, takes on a substantial form, but which is still present in the final result: in the case of the statue, it is the wax; in the case of a wall, the bricks; in the case of a Hermes, the stone; in the case of a house, the materials; and, in the case of ice, water. The underlying thing must surely both pre-exist and undergo change as a result of the generation. In *GC* 1.4, Aristotle makes the same point: once the coming-to-be occurs, the substrate is still present, it just cannot be perceived as the whole that it was before the coming-to-be.[13]

Phys. 1.7 not only shows that artefacts have matter and that this matter pre-exists the compound, but, more importantly, it leads to two significant conclusions. First, artefacts undergo unqualified coming-to-be, which suggests that they are hylomorphic compounds and not merely material substrates that acquire a property (i.e. accidental compounds). It is a house that comes-to-be, not merely bricks or bricks arranged in a house-like manner. Second, for an artefact to come into existence, there needs to be a material substrate that must change in a relevant fashion. What is such a change in the matter? The matter needs either (i) to continue to be of the same kind, but to increase or decrease in quantity or undergo a change in shape or (ii) to be assembled out of heterogeneous components, or (iii) to be internally altered in some relevant way.[14] In all cases in which the matter consists of parts, these parts are fused together into a single thing: this is the relevant change. Several homogenous parts may be fused into one thing by adding them together (non-biological addition) or by removing some of

[13] I am aware that this interpretation is not uncontroversial. Most recently, Henry (2019) has argued against a persistent substrate, for instance. One could rightly wonder in which way the matter can be said to remain if it must change. Indeed, Aristotle does not explicitly mention that the matter remains when he focuses on the underlying and pre-existing matter. However, from the discussion in *Met.* Z 7–9, it is clear that the emphasis on the underlying matter is urgent precisely given the presence of a residual matter in the object. Further discussion on this issue will be provided in Section 4.2 and Chapter 6.

[14] We will see in Chapter 7 (Section 7.3.3) how changes operated on homogenous materials can be understood in terms of plurality becoming one as well.

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them (subtraction), or again several heterogeneous parts in a state of separation can be combined into a single object (composition and biological addition). Other ways in which the matter can undergo an intrinsic change allowing for a generation are changing shape (shape-change) or undergoing alterations *in* its *stuff* (alteration in such a way as to create a new substance). How, then, does this differ from the case of Socrates becoming musical? 'Turning musical' also seems to be an intrinsic change of the substrate. However, in our cases, the alteration of the matter is that through which a new object comes into existence. The thing that comes-to-be is both new and the same as what it was before the change.

I have supplemented the analysis of *Phys.* 1.7 with *Met.* H 2. Because the processes leading to new substances in the realm of coming-to-be correspond to the *differentiae* in the realm of being, let us now focus on *Met.* H 2. Here, Aristotle presents a series of examples of human-dependent objects and lists their *differentiae* (i.e. what makes each of the them different from the others):

> But evidently there are many differences; for instance, some things are said [to differ] by a composition of the matter, e.g. the things formed by blending, such as honey-water; and others by tying, e.g. bundle; and others by gluing, e.g. a book; and others by nailing, e.g. a casket; and others in more than one of these ways; and others by position, e.g. threshold and lintel (for these differ by being placed in a certain way); and others by time, e.g. dinner and breakfast; and others by place, e.g. the winds; and others by the affections proper to perceptible things, e.g. hardness and softness, density and rarity, dryness and wetness; and [of these] some things by some of these [qualities], others by them all, and in general some by excess and some by defect. Therefore, clearly, *is* is said in just as many ways. (*Met.* H 2, 1042b15–26)

Some examples are similar to what we find in *Phys.* 1.7: for instance, the house is defined by the composition of its matter. However, in *Met.* H 2, Aristotle also mentions cases in which the outcome differs in virtue of position, time and place. This passage raises a problem concerning the completeness of the discussion in *Phys.* 1.7. Is the list of the means of artificial generation exhaustive? In *Met.* H 2, the threshold and the lintel differ by position (*thesei*), the winds differ by place (*topôi*), and breakfast and dinner differ by the time (*chronôi*) in which they are served. Should one group together such cases with those things differing from each other by the affections proper to perceptible things? There are two main reasons for thinking that we should not do so: (i) they are not affections exclusive to perceptible substances, since place and time might pertain also to things without matter; (ii) more importantly, Aristotle

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clearly distinguishes such cases from the case of things differing by affections proper to perceptible things, in *Met.* H 2. Should we therefore say that the list in *Phys.* 1.7 is not exhaustive, since it overlooks position, time and place (at least), or are we rather to believe that these cases do not qualify as means to generation? All of the processes that Aristotle explicitly presents as means to generation require an intrinsic change in the matter consisting of several parts fused together or in a substrate that changes internally. In the case of things differing by place, position and time, it is the case neither that several parts of the matter are fused together nor that a substrate is internally changed (i.e. the matter does not undergo any relevant change). For a new substance to come into existence, not only does the matter need to pre-exist, but it must also change. A given matter that is merely placed somewhere else or consumed at another time is not a matter for the coming-to-be of a new substance. The change required in the matter has to happen to the matter intrinsically: on its own, no external change, such as change of position or time, can bring into existence a genuine new artefact; a change that does not fuse together parts into a single thing or does not internally alter a substrate cannot lead to generation. A stone that is merely put on top of some sheets of paper does not undergo any intrinsic change, such that the stone is simply a stone and not the matter out of which a paperweight comes-to-be. Placing something does not count as an alteration corresponding to the coming-to-be of an object. A cucumber I eat in the morning is simply a cucumber and is not the matter for the coming-to-be of a breakfast, just because it is eaten in the morning.[15] The list from *Phys.* 1.7 might not be exhaustive, but all of the examples are alike in that the matter undergoes a relevant change through which several parts are fused together into a single thing, except in the case of shape-change and alteration, in which there is only one part, but one that is still intrinsically modified in its constitutive stuff. In *Met.* H 2, the cases that correspond to proper generation in *Phys.* 1.7 are introduced as cases in which there is a 'composition *of the matter*'. It is an alteration of the matter that allows for the coming-to-be. One speaks of matter with reference to an object having such matter. In the case of the threshold, the alteration is an alteration of the wooden beam, not as the matter of something – the wooden beam does not undergo any intrinsic change – but as a thing. A threshold seems to be an example of an accidental compound, where the wooden beam is merely

[15] There is a range of items falling outside the class of artefacts whose ontological status is not clarified by Aristotle. Examples include dinner and breakfast, the threshold and the lintel, and human-independent beings such as the winds. Situating such objects in Aristotle's ontology falls outside the scope of this book, but my hunch is that such items qualify as accidental unities such as *Socrates-being-white*. I would call them 'conventional beings'. See Section 4.1.3.

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placed somewhere else, but, since it does not undergo an intrinsic change, it does not undergo generation in the proper sense and hence does not constitute a new substance.[16] Certainly, the generation of something does not occur anytime there is the alteration of some matter: not only must there be a relevant change in the matter, but the change must also occur in a specific way, such that the thing acquires a certain form. This form is, in turn, responsible for unification and identity, which will be discussed in Chapter 7. Here it will also become clear that the list in H 2 is longer than the list in *Phys.* 1.7 because, in the former passage, Aristotle is arguing against Democritus that the *differentiae* are more than just shape, position and arrangement and therefore includes unqualified and qualified comings-to-be.

The relevant change in and continuity of this matter are still not sufficient for something to come-to-be. One might well perform these alterations without bringing anything into existence. What the agent does to the matter sometimes leads to the generation of a new substance, but at other times it does not. It is not sufficient merely to put together materials; the materials must be put together *in the right way*, namely in such a way as to create a new substance. The *right way* is given by the form, which must also intervene and set constraints on the matter. In *Met.* Δ 6, 1016b11–16, Aristotle presents the interesting case of the shoe-making process: to produce a shoe, one cannot assemble the various parts randomly, but one has to put them together so as to realise the form of a shoe and therefore make a shoe come-to-be. The form of a shoe or a house sets constraints on the way in which the matter must be changed, that is, the manner in which the parts must be fused together into a single thing. Unlike the form of a house or a shoe, the form of a threshold does not dictate the way in which the matter must change such that the coming-to-be occurs.

Artefacts are generated by a change in a matter that pre-exists and is still present in the end result. The change in the matter leads to the existence of a new artefact if, and only if, it occurs in a specific way, such that the thing has a form of the same kind as the form in the mind of the artisan.[17] No unqualified coming-to-be can occur through the alterations of *Phys.* 1.7 if the change in the matter is not of such a kind that makes a substantial form realised. As we learn from *Met.* Z 7–9, this form is of the same kind as the form in the mind of the artisan, which is the starting point of a production (*Met.* Z 7, 1032a32–b1). Complicating the matter is the fact that this form is

[16] See Ross 1924, 229; Bostock 1994, 258.

[17] I speak of the 'mind of the artisan' in order to relate the topic to modern discussions. Aristotle speaks of a form in the soul (*psuchê*) of the artisan and of things that come-to-be through the agency of thought (*dianoia*) or reason (*nous*).

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characterised in three ways, emphasising different aspects of the production of artefacts: (i) Formula and knowledge (*ho en têi psuchêi logos kai hê epistêmê* at 1032b5-6); (ii) Art (*hê gar technê to eidos* at 1034a24); (iii) Essence and primary substance and substance without matter (*prôtê ousia* at 1032b2 and *legô de ousian aneu hulês to ti ên einai* at 1032b14).

In relation to (i), the form in the mind of the artisan is not described in physical terms (i.e. as en-mattered and constituting a particular compound or as potentially the form of the object). Rather, the form is, in general, described as an epistemological notion that the artisan has in their soul. In fact, this notion is the fundamental starting point of the reasoning, which, in turn, is the first stage of production.[18] The artisan, or whoever possesses an art, has knowledge of what should be produced. The relevant change in the matter, which makes possible the generation of an artefact, must be performed in such a way as to realise the notion the artisan has in mind. Now, one might object that despite the importance of the form for driving the change, this framework also applies to qualified coming-to-be and to qualities, such as health – upon which Aristotle relies quite often. It therefore does not indicate that the object is a hylomorphic compound. In response to this, we ought to keep in mind that – just as a change in the matter does not mean that a hylomorphic compound comes-to-be in the absence of a form dictating this change – the presence of a form that fails to dictate or drive a relevant change in the matter does not bring into being a hylomorphic product either. In other words, the existence of the form in the mind of the artisan alone does not guarantee that a new substance comes into existence, for the form must be accompanied by a relevant change in the matter corresponding to the kinds illustrated.

As regards (ii), in what sense is the form in the mind identified with art? Is this the case only because possessing the art implies possessing knowledge? In Chapter 4, I shall argue that the identification of the form in the mind with art ultimately amounts to showing that the pre-existing form has an efficient causal role. In relation to (iii), the identification of the form

[18] In Z 7, Aristotle explains that the process of healing is divided into two stages: (i) the reasoning (*noêsis*) and (ii) the production itself (*poiêsis*). The reasoning begins with the notion (the form) of that which is to be produced. If the doctor aims to restore health, they must begin from the notion of health and what proceeds from it. Aristotle suggests, for instance, that in order to arrive at a healthy condition, a uniform state must be reached, and if the doctor strives to obtain a uniform state, heat must be present. This reasoning operates as a chain of interconnected steps based on the product that the artisan wishes to realise. It begins with the notion of the desired product and ends with the notion of that which the artisan can immediately produce. The reasoning ends at the point at which the production begins, meaning at the stage of the reasoning where the artisan can immediately perform an action.

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in the mind with the form or the substance devoid of matter is, at first sight, trivial. Indeed, one could explain this identification by arguing that the artisan has in mind the account of an object, not the object itself. However, I shall argue that Aristotle identifies the form in the mind with the form without matter by referring to a $form_1$ in the mind and a $form_2$ in the object, whose relation to each other grounds the application of the synonymy principle to artefacts. While I address the form in the mind of the artisan qua art in Chapter 5, I shall deal with the form in the mind of the artisan qua substance without matter in this chapter (Section 4.3).

4.1.2 *Per Se Unities*

Let us now address and clarify a possible ambiguity: the substantial-change criterion shows that hylomorphic compounds of the sort mentioned in *Phys.* 1.7 are generated. However, this criterion does not entail that these objects are substances. It merely shows that what is subject to generation are things that would belong to the category of substance rather than other categories such as the quality of being musical. *Phys.* 1.7 presents hylomorphic compounds without engaging with questions about substantiality and without yet addressing to what extent the forms of the listed compounds are forms in the proper sense. An examination of further texts is needed in order to be able to comprehend what 'powers' such beings have. What we know is that these beings are subject to generation and have matter and form. In other words, having a substantial form does not coincide entirely with being a substance in the technical sense of substantiality. Other texts will help us to clarify whether there are hylomorphic compounds that are not substances. There are indeed hylomorphic compounds whose forms are, to different degrees, responsible for their unity and their ontological status.[19] The substantial-change criterion shows that artefacts undergo unqualified coming-to-be and therefore have forms which cannot be identified with accidents. Further evidence in support of this conclusion comes from Aristotle's distinction between per se unities and accidental unities in *Met.* Δ 6.[20] While per se unity is a property

[19] As I shall argue later on, forms of living beings are efficient and final causes, assuring a higher degree of unity and substantiality. There are, however, hylomorphic compounds whose form is neither an efficient cause nor a final cause. Artefacts are somewhere in the middle: their forms are not efficient causes (Chapter 5), but they are formal and final causes (Chapters 6 and 7).

[20] In *Met.* I 1, Aristotle discusses notions of the one per se. He does not provide a discussion of accidental unity but makes a reference back to Δ 6. The first notion of per se unity corresponds once again to the continuous. *Met.* I 1 will be addressed in the final chapter.

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belonging to a single item, accidental unity is a property belonging to a plurality of items, which happen to constitute a compound that is unified to some extent (what we usually call 'accidental compounds' or kooky objects). *Met.* Δ 6 is specifically devoted to defining in general terms the distinction between being one accidentally and being one per se. Being one accidentally (*kata sumbebêkos*) is represented by the cases of 'Coriscus and the musical' and *Coriscus-being-musical*. In both cases, the musical is nothing but an accident belonging to a substance as a property. To be sure, Coriscus and the musical are not different people, but the unity they display is only accidental in that musical is not in the substance like man would be in Coriscus, but it belongs to Coriscus as a property or affection (*ôs hexis ê pathos tês ousias*). Per se unities are classified into three types. Unities are per se either because they are continuous or because their matter is one in species and indivisible into different species or again because their definition is one. Aristotle clearly conceives of artefacts as continuous items and hence as unities per se. What does he mean by 'continuous'? An important definition of 'continuous' is found in *Phys.* 5.3, 227a11–12:[21] 'I say that a thing is continuous when the boundaries at which each of the two parts are in contact become one and the same and, as the name itself signifies, contained in each other.'[22] Examples of continuity are a bundle that is made one by being tied together and pieces of wood made one by being glued together. For instance, instead of our having the boundary of one piece of wood and then another boundary belonging to another piece of wood, the glue itself becomes the single common boundary of the several pieces of wood: the result – presumably a casket – is a continuous item. Of course, things that are continuous by nature display a higher degree of unity than things that are one by art, but it nevertheless remains true that artefacts are continuous things.[23] Aristotle does not conceive of artefacts as accidental unities. He does not take the casket to be like 'Coriscus being musical' (i.e. like 'the pieces of wood being glued together').

[21] It is worth specifying that in the *Physics* the treatment of the notion of continuous is technical, whereas in the *Metaphysics*, continuous means more generally 'holding together'. Another difference between the two texts, as Castelli (2010, 85) highlights, is that, in the *Metaphysics*, continuity is presented more as a form of unity and indivisibility, whereas in the *Physics*, continuity is presented as a form of infinity.

[22] The same definition is provided in *Met.* K, which sheds some light on the notions involved in the concept of continuity. At the end of the chapter, Aristotle defines continuity as a sort of contiguity: 'I mean that two things are continuous when the limits of each, by which they make contact and by which they are kept together, become one and the same' (K 12, 1069a5–7).

[23] A more detailed discussion of artefacts as continuous and wholes is provided in Chapter 7 concerning the relation between the whole and its parts.

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The discussion of 'the one' in Δ 6 places artefacts in the class of continuous items. Further evidence is provided by the discussion of wholeness in Δ 26, where Aristotle classifies technical objects as wholes by including them among beings that are continuous and limited. Continuity, as we shall see in Chapter 7, is presupposed by the existence of a whole. Again, items such as a house or a book are per se unities by being continuous beings, and they are opposed to the accidental unity of *Socrates-being-pale*. Other human-dependent objects are regarded just like *Socrates-being-pale*. Beings such as dinner and breakfast (see H 2) are indeed accidental unities. Breakfast, for instance, is conceived of as *cucumber-being-served-in-the-morning*. Aristotle's notion of per se unity and unqualified coming-to-be draws a neat line between artefacts and other human-dependent objects that are accidental beings. Artefacts undergo unqualified coming-to-be and, in virtue of their being continuous, qualify as unities per se. A plurality is made into some new one thing. Items such as dinner and breakfast do not come-to-be; rather, their matter acquires a non-substantial property and they are therefore accidental beings. Of accidental things, Aristotle says, there is no generation and corruption. Accidental is 'in name only' or 'only a sort of name' (*Met.* E 2). Thus, artefacts are not accidental beings and do indeed undergo unqualified coming-to-be. What comes-to-be has a substantial form corresponding to an essence and a definition. By contrast, dinner and breakfast (but also the different winds,[24] or again the lintel and the threshold) are accidental beings. In fact, these things do not undergo unqualified coming-to-be. One might call the cucumber served in the morning 'breakfast', but this is a mere name, for breakfast has not really come-to-be.[25]

4.1.3 Nature-Facts and Found-Objects: The Paperweight and the Strigil

Before moving to the other arguments in defense of artefacts' hylomorphism, let us address one category of objects discussed in the contemporary debate, which Aristotle does not analyse but is able to assess. I am referring to the objects called 'nature-facts' and asking whether Aristotle would regard them as artefacts or not.[26] Nature-facts are natural objects taken

[24] Direction is essential to the winds, but wind does not introduce a new ontological level over its matter/subject. One might certainly define winds and find what is essential to them (just as it is possible to define any accidental compound, as stated in *Met.* Z 4). The possibility to define them and to advance 'direction' as their essential trait does not make them hylomorphic compounds.

[25] In more modern terms, according to Aristotle, these qualify as conventional kinds. Artefact-kinds are not conventional but real, as will be explained in more detail in Chapter 6 (Section 6.1).

[26] Compare the discussion of what makes something a toy or plaything in Kidd's (2019, chapter 4).

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from their environment and used as tools or for different purposes.[27] A clear example is that of a rock taken from its natural environment and used as a paperweight. Would Aristotle regard the paperweight as an artefact? For the reasons we have seen in the previous section, Aristotle would not regard the paperweight as a new item. According to Aristotle, every coming-to-be involves a material substrate that, although it survives the change, needs to change itself. In the case of a rock that is merely placed on the table, the matter does not change, and Aristotle would not regard this as the coming-to-be of a new artefact. In order to create a new artefact, the matter must change to some extent. That is, the underlying material from which the artefact comes-to-be needs to undergo a relevant change. Aristotle does not discuss the possibility of using something natural for another purpose, but he is aware of it, since he considers the case of something artificial used for a purpose different from the one with which it came-to-be. In this sense, Aristotle did not explicitly address nature-facts, but rather found-objects. The former are natural objects used for certain human purposes, whereas the latter are human-made object used for a purpose that is different from the one for which they came-to-be. In the *Politics*, Aristotle argues that what we possess has two uses: one is proper, the other improper (*Pol.* 1.9, 1257a10–14). For instance, the proper use of a shoe is to be worn, while the improper use of it is for exchange. The improper use of a shoe concerns the shoe as such, but it is not the use for which the shoe was initially made. In *EE*, the improper use of a coat or a shoe is described as an accidental mode of using the object. One might use a shoe for its proper purpose (i.e. wearing it), as well as selling it or to letting it out for money (*EE* 3.4, 1231b38–1232a4). In *Top.* 4.6, Aristotle refers to the strigil, a tool for cleansing the body by scraping off dirt, perspiration and oil. Of course, one might use the strigil for another purpose, such as for drawing off liquid. However, the natural correlative (*ho pephuken*) of such an object is, as Aristotle says, 'that for which it would be used by the prudent man, acting as such, and by the science appropriate to that thing' (145a26–7). It seems likely that the same reasoning would also apply to the rock, which *pephuken* is neither to keep the papers from blowing in the breeze nor to keep a sheet from moving while painting with a brush.[28] Of course, if one removes a rock from its natural

[27] They are usually called 'biofacts' and not regarded as artefacts by archaeologists. However, I shall call them 'nature-facts' so to more clearly include beings that are found in a natural environment without necessarily being a once-living body.

[28] Naturally, the fact that such a good example comes from the *Topics* makes it suspicious. However, Aristotle provides philosophical reasons for believing that the strigil-example is a trustworthy one

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environment and smooths it in such a way that the material is changed with a view to its new function as a paperweight, one would thereby produce an artefact. The change of position (taking the rock from the ground and putting it on the papers) is not in itself a production unless the matter undergoes some change in its material constitution. The same principle applies to the example of the threshold in *Met.* H 2, 1042b19–20: for the threshold to be such it must acquire a certain position, but the wooden beam must have undergone some change (and not only in position) to be regarded as an artefact. The piece of wood found in the forest and simply placed under the door is still a piece of wood. The act of creation must involve some material change in the physical world. In the contemporary debate, the wooden beam that is not worked, but simply placed under the door, would be called a 'nature-fact', whereas the strigil used in a different way would qualify as a 'found object'. The topic of found-objects is linked to the problem of user-intentions. According to Kornblith (2007), the intentions of later users of a certain object might override the original author's intentions regarding the nature of the object. From the example of the strigil, it should be clear that Aristotle's essentialism lies on the side of the author. Those who use the strigil for another purpose (no matter how numerous they are) neither override the author's intentions nor supplement them, but rather, they are not behaving as prudent men. To return to nature-facts: intentions and teleology, although constituting a necessary and inescapable factor in artificial production, do not suffice for a natural thing to become a new artefact. For a new artefact to be created, the following condition needs to be fulfilled: the matter must undergo an intrinsic change consisting of more than a mere change of place.

4.2 It's Not Bronze, It's a Brazen Statue

4.2.1 The Eikeininon *Rule*

In *GC* 1.4, Aristotle presents the case of the round bronze becoming rough as an alteration. However, becoming rough seems rather a change of shape, which in *Phys.* 1.7 is introduced as an unqualified coming-to-be. In this regard, it is important to stress that change of shape as such can be the alteration of some matter without coinciding with the unqualified coming-to-be of something. In the case of *GC* 1.4, the sensible substrate (i.e. the

(see Chapter 4 (Section 4.1.1)). Changing something's nature just is to destroy it and to make something new; but this requires a change in the substrate.

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bronze) is altered in its shape (i.e. from round to rough), but the bronze is still the subject of change. A different case is if, instead of speaking of bronze, we speak of a sphere. If a portion of rough bronze becomes round, this still qualifies as an alteration that the matter as subject undergoes; but if a portion of rough bronze is made round by an action that induces the form of a sphere, we need to identify the alteration of the matter with the unqualified coming-to-be of the sphere, which comes-to-be. That which takes on a certain shape, in the sense of a substantial form, ceases to be called by the same name as that out of which it came-to-be. If we can prove that artefacts cease to be called by the same name as their matter, we will have further evidence that they take on a substantial form (i.e. that they are hylomorphic compounds). In *Phys.* 7.3, Aristotle states that the alteration of something – for instance, the cooling of some matter – might be a necessary condition for something to be generated, without this meaning that alterations are unqualified comings-to-be or that generation corresponds to alteration. Rather, for something to undergo unqualified coming-to-be, an alteration needs to occur (or to be performed). For a statue to undergo unqualified coming-to-be (i.e. to come-to-be), an alteration of its bronze needs to occur. If this happens, the statue is no longer called 'bronze', but rather 'brazen'. As Aristotle says, 'we do not call the statue bronze or the candle wax or the couch wood, but we use a paronymous expression and call them brazen, waxen, and wooden respectively' (245b10–12). When something undergoes unqualified coming-to-be, this thing is not merely its matter plus an acquired property (as in the case of qualified comings-to-be). Aristotle applies such rules to artefacts too, which are subject to unqualified coming-to-be.

This principle is introduced and further discussed in *Met.* Z 7 and Θ 7. Since both the bronze and the brazen statue are made of the same material (i.e. bronze), one might wonder whether the same rule also applies to more complex objects. In Z 7, Aristotle mentions simpler as well as more complex artefacts:[29]

> But as for things whose privation is unclear or without a name – for instance, in bronze, [the privation of] whatever configuration, or in bricks and timbers, [the privation of] house: it seems that they [statue, house] come-to-be from these like in the other case [the health comes-to-be] from the sick: this is why, just as in the other case the thing is not called 'that out of which' [it comes-to-be], so here the statue is not called wood, but rather

[29] In Θ 7, Aristotle does mention a more complex artefact, a house (1049a9–11), which is not made of one single material, but he does not provide any concrete examples of its matter.

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> acquires the term *wooden*, and *brazen* but not bronze, and *stonen* but not stone, and the house *bricken*, but not bricks – since, if one were to consider the question carefully, it also is not the case that 'out of' wood a statue comes-to-be, or 'out of' bricks a house, one would not say it unqualifiedly, because coming-to-be requires a change in the 'out of which', but not that it remain. (*Met.* Z 7, 1033a13–22)

To point out that the statue is braz-*en* and the house is ston-*en* is not only a way of indicating what the proper matter of a specific object is, but also and especially a way to demarcate what is substance and what is attribute. The *ekeininon* rule thus establishes that what comes-to-be unqualifiedly is never just matter, but a substance whose proximate matter is its attribute. The same rule is found in more detail in Θ 7, which is devoted to answering the question of when and under which conditions matter is potentially *x*. There seem to be discernible stages, preceding the stage at which the matter is potentially *x*. Roughly speaking,[30] this last stage is reached when the artisan does not need to add, change or take away anything from the matter. As long as the matter still needs to be changed, it is not yet potentially the artefact. This claim is, of course, fairly vague, but it will be spelled out in the next section, where the link between *Phys.* 1.7 and *Met.* Θ 7 will emerge most clearly. For instance, as Aristotle demonstrates through an example, bronze is potentially the statue, but earth, despite being the matter of the statue, is not yet potentially the statue because it needs to change (i.e. change into bronze) (1049a17–18). Aristotle highlights an important point: the Greek language reflects and, hence, answers the metaphysical and temporal question.[31] Some matter *y* is potentially *x* when that *x* is *y*-en:[32]

> For instance, the box is not earthen, nor earth, but is wooden; this [=some wood] is what is potentially a box and this is matter of a box, wood in general of box in general, and of this box, this wood. (*Met.* Θ 7, 1049a22–4)

To say that a box is wooden means that wood is the stage of matter to which we must refer if we are looking for the matter that is potentially a box. Although wood, in turn, comes-to-be out of earth, this does not make the box earthen (i.e. it does not make earth potentially a box). Only the most remote stage of fire is identified by Aristotle as not being a *tode ti*

[30] The conditions under which something is potentially F are discussed in more details in Section 4.2.2.
[31] 1049a18: *eoike de ho legomen* in the sense of 'we Greek speakers'.
[32] On the *ekeininon*, see Beere (2006).

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(i.e. something determinate; 1049a27). Aristotle is here working with quite a loose notion of *tode ti*, especially when compared with other passages in which the notion of *tode ti* is used more strictly. For instance, in *Met.* Z 3, Aristotle excludes matter as a candidate for being substance precisely because it is not something determinate, a 'this something', but is further differentiable. Here, by contrast, there is a less strict notion of *tode ti*, according to which even wood itself (i.e. the matter (of the box)) can be a *tode ti* relative to earth. Relative to earth, wood is a *tode ti*, while relative to the box, it is matter and attribute. On a stricter account of *tode ti*-ness, earth would not have any claim whatsoever to be a *tode ti*.[33] Certain substances have stronger claim than others to be a *tode ti* and not to be the attribute of something else. For instance, Socrates is fleshy and bony, but there is nothing Socrates-*en*.

In general, we have to identify what the artefact in question is and, in order to understand what stage of matter is potentially the artefact, we must identify the stage at which the matter is ready to be turned into a table (i.e. the stage at which nothing needs to be added, taken away or changed with respect to the matter). In the case of a boxy table, the wood is not yet potentially the table because it needs to first be changed into several boxes. The several boxes are themselves the proximate matter of the table. The example of the box-*y* table is meant to show that, on this loose notion of *tode ti*, what counts as *tode ti,* as well as proximate matter, is defined in relation to the particular stage that we are focusing on. If additional stages are added, this means shifting the *tode ti* and the corresponding attribute. Matter must, in fact, play an explanatory role: in order to give the most accurate explanation of a substance, its proximate matter must be mentioned, because this stage involves fewer objects. Mentioning earth would not explain as much as mentioning wood, when it comes to describing a (wooden) statue. While the *ekeininon* rule does fit better with single-material objects, whose proximate matter is a single material, it also holds for more complex objects. It states that if something genuinely comes-to-be, this thing is not reducible to its matter; and indeed, one must use a paronymous expression in speaking of it. Artefacts are subject to this rule. Let us now examine it in detail in order to help understand how the unqualified coming-to-be-criterion and the *ekeininon* rule are connected.

[33] In Z 16, Aristotle excludes elements from the class of substances, as they are like a heap (i.e. they are not something determinate). In this passage, then, the considered account of substance as we find it in the end of Book Z is not in play any longer.

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4.2.2 Actuality-Inducing Action as the Relevant Change in Matter

Met. Θ 7 illustrates the conditions under which something (i.e. matter) is potentially F (i.e. an object). The criterion for establishing the appropriate matter is further spelled out using examples of artificial objects (i.e. health and a house). The first example runs as follows:

> And definitory of what comes-to-be in actuality from thought out of what is potentially, is that when it is willed [by the agent] it comes-to-be as long as nothing external hinders; on the other side, in what is being healed, when none of the things in it hinders. (1049a5–8)

The passage specifically deals with things that are by thought (*apo dianoias*),[34] namely things brought about by rational capacities. The focus is on the questions *under what conditions* and *when* a patient is potentially healed:

- *The patient is potentially healed if, provided that the doctor wills it and nothing external hinders it, they will become healthy.*

Which in turn means:

- *The patient is internally ready to be healed if, provided that the doctor wills it and nothing external hinders, they will become healthy.*

On the reading of Beere (2009), the criterion for potentiality means that if the doctor wills it and nothing external to the matter (which also means external to the doctor and the process of healing) hinders it, then the patient will become healthy by themselves. That is, there is nothing more that the patient needs in order to become healthy, provided that the doctor is willing to heal them and there are no external hindrances. Of course, the agent (i.e. the doctor) must be willing (*boulêthentos*) to bring about the change. The agent is elsewhere said to act based on a desire (*orexis*) in Θ 5, or a choice (*prohairesis*) in Δ 5.[35] Aristotle does not spell out the nature of external hindrances, but they potentially include anything external that makes the production in question impossible, such as the unavailability of tools or the absence of light.[36] The absence of external hindrances and the presence of the artisan's will are not themselves conditions for some matter to be potentially F, but rather pre-conditions that, when coupled with the absence of internal hindrances, suffice for the matter to be potentially F.[37] If, although the pre-conditions are

[34] See the discussion in *Met.* E 1 and Z 7 and Chapter 3 (Section 3.3.2).
[35] *Met.* Δ 5, 1015a27 and Θ 5, 1048a11.
[36] Michael of Ephesus, for his part, suggests conditions concerning place and time (*in Metaph.* 582,13).
[37] Beere is opposing the traditional view (Frede 1994; Charles 2010b) according to which the conditions displayed are three: two in the side of the maker (i.e. absence of external hindrances and

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fulfilled, the patient does not, in fact, become healthy, this means that the patient is not *yet* potentially healed. Four different ways of interpreting this last statement have been proposed: (i) the patient is simply not the type of thing that can, in principle, be made healthy (e.g. a stone); (ii) the patient is in such a state that health cannot be restored; (iii) the patient is, in principle, curable, but the treatment required would kill them because of other conditions (e.g. co-morbid conditions); and (iv) the patient is curable, but not in their current state (e.g. they are underweight). The last option is the most satisfactory, for the proximate matter is matter that is *already* potentially F, and matter that is not potentially F is not proximate matter *yet*.

Aristotle illustrates this using the example of some matter being potentially a house (no artisan is mentioned here), dropping the pre-conditions and focusing only on the real condition:[38]

> Similarly, a house too is potentially: if none of the things in this, i.e. in the matter, hinders its coming-to-be a house, and if there is nothing that has to be added, or taken away, or changed, then this is potentially a house; and also for other things whose principle of coming-to-be is external. (1049a8–12)

- *A certain matter is potentially a house if, provided that the housebuilder wills it and that there are no external hindrances, the matter will turn into a house.*

Which, in turn, means (given that he drops the pre-conditions):

- *A certain matter is internally ready to be a house and, hence, it will turn into a house, if there is nothing that must be added, taken away or changed in order for it to turn into a house.*[39]

Something in the matter could act as a hindrance when it is not yet ready to be turned into the object in question. This is related to the fact that in artificial production the matter is not given in the same way as it is in nature.[40] If the matter is not potentially a house, there is something in the

presence of the artisan's willingness), one on the side of the matter (i.e. absence of internal hindrances). Beere has convincingly proved the traditional view to be redundant.

[38] Θ 5, 1048a16–21: 'There is no need to add to the expression "nothing external hindering"; for what has the potential [has it] in the sense that it is potential for acting, and this is not under all circumstances but under certain conditions, among which will be the exclusion of external hindrances; for these are precluded by some of the conditions present in the determination.'

[39] This does not mean that there is no further taking away or changing in the subsequent building of the house. As we will see later in this section, we must distinguish between the process of making the material ready and the production of a house.

[40] *Phys.* 2.2, 194b7–8. On this point, see Chapter 6 (Section 6.2.3).

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matter that prevents the goal from being reached. How is this possible? I follow Michael of Ephesus in taking the claim that nothing has to be added, taken away or changed as a specification of the absence of internal hindrances in the matter. Beere, by contrast, identifies two separate conditions pertaining to the patient: in the first case, the matter is defective, in the sense in which bricks used for building that turn out to be broken are defective; in the second case, the matter simply has not yet reached the appropriate stage. However, matter that is irremediably broken is like the stone that cannot be healed. The problem with the stone is not so much that it is not *yet* potentially healed, but that it *cannot* in principle be healed. Michael of Ephesus considers only one complex condition that is composed of two quantitative conditions and one qualitative condition: nothing needs to be added if the artisan has a sufficient amount of bricks and stones at their disposal; nothing needs to be taken away if there are no superfluous bricks or stones; finally, nothing needs to be changed if the artisan does not have unworked materials that require sawing or grinding down.

However, the passage cannot be wholly explained unless we answer the following question: what is the difference between adding, taking away and changing, on the one hand, and the actual production of an artefact, on the other? As we have seen, the generation of artificial items is described as something similar to these processes. The question arises from Aristotle's description of artificial productions as processes, which seem to be similar to the change in matter. As we have seen, in *Phys.* 1.7, 190b5–15, Aristotle illustrates unqualified coming-to-be with the following examples: the statue comes-to-be through a change in the shape of the matter; the Hermes comes-to-be through a process of subtraction carried out on the stones; the house comes into existence through some alteration – and here it is specified that a house is one of those things that change with respect to their matter. Why should we take the third condition to be a condition for some matter to be potentially F rather than a condition for some matter to be actually F? The aim of *Met.* Θ 7 is not to cast light on this problem specifically: the chapter rather investigates the difference between matter that is potentially F and matter that has a claim to be matter but cannot be matter in the strict sense. However, we can tackle the question by focusing on an example provided both in *Met.* Θ 7 and in *Phys.* 1.7. Let us consider the case of the statue of Hermes. Obviously, a statue comes into existence out of a block of material. The process through which the shape of Hermes emerges is subtraction. At what moment and under what conditions is the block of matter potentially the statue of Hermes and at what point is it already Hermes? Aristotle's view in

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Θ 7 is that a block of material is potentially Hermes when there is nothing more to be added to that material (e.g. if the block is big enough) or when there is only the bronze the artisan needs and no other superfluous materials – and the bronze is already bronze, meaning that there is no need to change copper and tin into bronze. The material the artisan has at their disposal at this stage is potentially the statue of Hermes, but it does not actually become the statue until the sculptor has altered the shape of that block of material. At this stage, the bronze can serve as matter of a statue. By contrast, the bronze is actually the statue when, strictly speaking, there is no longer a lump of bronze, but rather the statue. When the form is applied to the matter,[41] the product comes-to-be and the potential matter becomes the thing itself. Imagine, for example, an artisan working some wood. They remove a chunk of wood from the larger block, shape it and sand it down to the point where they have a wooden beam: this is the matter that is potentially F. The wooden beam, in other words, can serve as matter for the product the artisan has in mind: for instance, a threshold.[42] The wooden beam is actually the threshold when it is placed in the right position. Once the wooden beam is placed at the bottom of the door, there is no longer potential matter or a wooden beam, but simply a threshold. Of course, in a way, there is still a wooden beam (it has just been placed beneath the door), but when we ask 'what is that thing?' the correct answer is 'a threshold', rather than 'a wooden beam'. The occurrence of the form is what draws the line between the proximate matter and the coming-to-be of an object. The example of the statue of Hermes is trickier because the subtraction (e.g. the chiselling) can constitute both the process by which the sculptor, by removing material, makes it ready (and, hence, potentially F), and the process by which the actual statue of Hermes, through shaping, comes into existence (the matter is made actually F). The artisan might both cut out the block of stone at the quarry and chisel the block at their studio. As for the action of chiselling itself, why does the same act sometimes merely prepare the matter and other times lead to the production of a new object? As we have seen, what distinguishes the proximate matter from the thing itself is the form. Supposing that the statue of Hermes is bronze (matter) being shaped in a Hermes-like manner (form), the subtraction by which the bronze is shaped

[41] Or when it is predicated of the matter. See *Met.* H 2 and Chapter 7 (Section 7.1).

[42] I have argued that the threshold is not strictly speaking an artefact. However, I make use of it in this discussion because the processes of making the material ready and come-to-be are in this case more clearly distinguished. Moreover, and perhaps more importantly, in this case the matter undergoes an intrinsic change, such that we can talk about an unqualified coming-to-be and therefore a hylomorphic compound. This is different from the case in which the wooden beam undergoes only a change in position.

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in this way should rather to be counted as a coming-to-be. By contrast, the preceding subtractions are rather the stages through which the matter is made into a proximate matter. The difference between the two acts of chiselling is that when the Hermes comes-to-be, the artisan chisels in such a way as to produce the object (i.e. in such a way as to obtain one specific shape rather than another; e.g. Discobolus). Although the work on the material and the production of the statue seem to constitute a single, continuous process, there are, in fact, two processes: the chiselling that makes the material ready and the chiselling that produces the statue of Hermes. To clarify this important point, it might be helpful to consider an example in which the two processes are more easily distinguishable. Let us consider anew the production of a house. There are two processes involved: the one consists in making the material apt for housebuilding; the second is the actual process of housebuilding. The first process concerns the matter about which Θ 7 speaks: this $matter_1$, once it has been made ready, is the potential house. The second process concerns a $matter_2$ that already constitutes the house, because it is either the house itself or (the stage before) a part of the house. This point is of significant interest, because it sheds light on the stage at which the matter is potentially the product without there being the product yet.

According to Figure 4.1, the matter that is potentially the house is $matter_1$ in its last stage, namely, in this case, bricks. Clay is a too remote a matter, whereas the foundations are already part of the production of the house. The bottom-up approach pursued by Frede seems to be consistent with the text. According to Frede, the matter that is potentially the house is to be identified with the bricks, when there is only 'a specifiable single change or process' between the bricks and the house.[43]

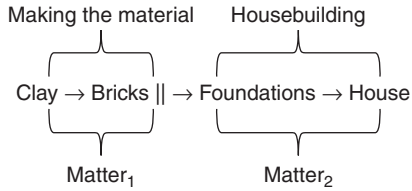


Figure 4.1 Difference between a matter that is potentially the object and a matter that is part of the object

[43] 'So for something to be a potential F it is not good enough that in a long series of changes it finally can end up as an F. There must be a specifiable single change or process which could turn it into an F' (190).

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The analysis that has been conducted so far is precisely meant to specify what this single change or process is supposed to be. The comparison with the simple coming-to-be mentioned in the *Physics* clarifies that what draws the line between a matter that is potentially F and a matter that is actually F is not a single *kind* of change or process, but a single action that is actuality/form-inducing. Charles (2010b) suggests three ways of interpreting the boundary between a matter that is potentially F and a matter that is actually F. A first possibility is to identify the matter that is potentially F with a matter that can be turned immediately into a house (i.e. when all of the bricks but the last one are in place).[44] In the light of the considerations we have raised, however, a house in which only one brick is missing would still count, to some extent, as a house (i.e. as matter that is actually F) insofar as there are already parts of the house.[45] A second possibility is to identify the matter that is potentially F with the point at which it can be handed over to the builder and not before. However, if the builder both makes the material ready and builds the house, this criterion is vague. The third option suggested by Charles is the most promising and seems to be in agreement with our reading: 'the matter is potentially a house at that point at which no further material change is required in it for it to be ready to be turned into a house by an actuality-inducing agent and not before'. However, the top-down approach pursued by Charles leads him to take the matter of a house in Θ 7 to be the foundations. Since he defines the matter that is potentially the house as the matter that is intelligible 'by reference to the relevant goal', he should mention 'foundations' instead of 'bricks'. Bricks and stones might not be intelligible with reference to the relevant goal, whereas the foundations are ultimately the stage at which the goal is, in fact, most relevant. The interpretation favoured by Charles is the same one that I propose, but, since Θ 7 employs a bottom-up approach, I believe that to adopt a top-down approach is misleading. The actuality/form-inducing agent has already intervened at the stage of the foundations. The matter that is potentially F and not actually F is the stage immediately before the

[44] This is Michael of Ephesus' interpretation according to which the house is generated when the builder adds the very last brick.

[45] In this regard, I am with Themistius when he argues (*in Phys.* 197, 20–6): 'this thing has become a house, and so at some time it was also coming-to-be a house (in fact, it was coming-to-be a house when the foundations were being laid). And were you to quibble that at that stage it is not a house that is coming into being but only the foundations, you will at least concede that the foundations are something belonging to a house' (translation by Todd (2012)).

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agent induces the form. However, the third option also comes close to the second option, insofar as the third option focuses on the agent, whereas the second option differs only in that it articulates a distinction concerning matter. The second option was found to be unconvincing because of the possible identity between the artisan who makes the material ready and the artisan who builds the house. However, even if the same artisan is in charge of both processes, the matter can be said to be ready when it does not require any further change before being transformed into a synchronic matter.[46] The conditions for the potentiality of the matter are then extended to all things that have an external principle (1049a12), as opposed to those whose principle is internal (1049a13). Given the relationship between having an external principle and being an artefact, Aristotle seems to be dealing first with artificial cases (health, houses) and then extending his reasoning to encompass the broader range of things that have an external principle (i.e. that is not necessarily identified with art).[47]

Met. Θ 7 connects with *Phys*. 1.7 in an important way. According to *Met.* Θ 7, potential matter will turn into a given object if nothing prevents it and the artisan wills it. I contend that the passage from *Phys*. 1.7 concerns the actuality-inducing step described in *Met.* Θ 7. *Phys*. 1.7 suggests that the relevant change that the matter must undergo for something to come-to-be just is the coming-to-be of the final product. *Met.* Θ 7 speaks about the relevant change in the matter as an actuality-inducing action by means of which the matter that is potentially F becomes actually F. The matter is potentially a house at the point at which no further material change is required in it for it to be ready to be turned into an actual house by an actuality-inducing agent or rather by the last change performed by the agent (as Frede says: 'one specifiable single change'). The relevant change in *Phys.* 1.7 is the single last actuality-inducing change. This change turns the bricks into foundations by way of addition (i.e. by stacking them on top of each other).[48] This change occurs if the artisan *wills it*: the mention of the artisan's desire (Θ 7) or choice (Δ 1) to produce stresses that the actuality-inducing action is indeed taking place. In conclusion, the *ekeininon* rule is fully applied to

[46] As we will see in Chapter 6, synchronic matter is the matter out of which something is constituted as opposed to diachronic matter (i.e. the matter out of which something comes-to-be).

[47] See Chapter 3 (Section 3.3.2).

[48] *EN* 10.5, 1175a25 explains that things that are different in kind are completed by different things. 'This is the case in natural objects and artefacts: animals, trees, a painting, a sculpture, a house, an implement.'

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artefacts and shows that artefacts are not reducible to their matter, but are rather hylomorphic compounds.

4.3 Synonymy Principle

The fact that artefacts undergo unqualified coming-to-be and are not reducible to their matter are two strong pieces of evidence for the claim that artefacts have forms. The application of the synonymy principle to artefacts further proves the hylomorphic status of artificial objects. The application of this principle is based on Aristotle's identification of the form in the mind with the form of the object. The focus on the relation between the form in the mind (of the artisan) and the form of the object strengthens the view that artefacts are not merely matter, but that they possess their own form. In elaborating his account of coming-to-be, Aristotle has been assuming all along that the object has its own form and the application of the synonymy principle is a strong indication of this, particularly because the form in the mind turns out to be nothing other than the form of the object as it is thought.[49]

As mentioned in Chapter 2, the synonymy principle is Aristotle's alternative to positing Ideas: not only is there already a form in an artificial production, which makes the Platonic Ideas gratuitous, but there is also already a form in natural generation, which makes Ideas of living beings superfluous. The form of the offspring neither is generated nor exists over and above the particulars, because something pre-exists (in this case, the father) that has the same kind of form and that 'produces' this form in another (Z 8, 1033a34). A man comes-to-be by the agency of another man, who is of the same kind as the man coming-to-be: 'out of a man [comes] a man' (1049b25). Aristotle spells this out by stating that an actual man produces an actual man from something that is potentially a man. At the end of Z 9, Aristotle makes precisely this point, namely that which is potentially a man becomes a man if there exists beforehand another man in actuality:

[49] As I shall argue in Chapter 5, the focus introduces a stronger sense in which the form in the mind of the artisan is the efficient cause. In fact, the form in the mind of the artisan is the efficient cause not only due to being possessed by the artisan and sufficiently explanatory for the coming-to-be of artefacts, but it is also the *only* form of the object with an efficient causal role, as opposed to the inert form *in* the object.

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> But what is unique about substance, to conclude from these points, is that it is necessary that there exists beforehand another substance [of the same kind], in actuality, which makes it, for instance, an animal if an animal comes-to-be; whereas this is not necessary for quality or quantity, rather [it is necessary that it exists beforehand] only in potentiality. (Z 9, 1034b16–19)

Aristotle appears to be defending a sort of weaker version of the synonymy principle in the case of qualified coming-to-be as well. For Socrates to turn musical, there must be the potentiality for this to happen and there is no need for the separate form of Socrates to be musical, if Socrates himself is already potentially musical. However, Aristotle speaks about an aspect that is unique (*idion*) to substances.[50] What is unique about substantial compounds of matter and form is that there must exist beforehand another substance in actuality that makes the substantial compound. If we take the *idion* to be exactly what it is described as being, a problem arises. For it does not, in fact, seem to draw an actual distinction between unqualified and qualified coming-to-be: in the case of qualified coming-to-be, too, there must exist beforehand another substance in actuality (e.g. Socrates, if Socrates-being-musical must come-to-be).[51]

Most scholars believe that for the criticisms levelled against the Platonists to be effective, Aristotle also needs to defend a similar picture in cases that are not as (apparently) straightforward as that of a natural generation.[52] A house does not, in fact, beget a house, nor does a couch come-to-be from a couch,[53] with the result that it seems that the synonymy principle does not strictly hold in the case of artificial production. Moreover, while the pre-existing form might be obvious to a Platonist too, the form in the object is not. Aristotle introduces the synonymy principle to show that the superfluity of the Platonic Ideas applies to both artificial and natural instances of coming-to-be. However, for the synonymy principle to be an effective solution, it must also fully accom-

[50] By substance, it is not clear whether he means the form or the compound of matter and form. In favour of understanding substance as the compound of matter and form is the fact that he speaks about something that *makes* (*poiei*) another thing and that refers to the formula for the synonymy principle (*zôion ei gignetai zôion*).

[51] In order for the distinction to be effective, Aristotle needs to claim that in unqualified coming-to-be, there must exist beforehand another substance in actuality *of the same kind*. See Burnyeat 2001, 16–18.

[52] For instance, Menn (IIγ2) argues that in Z 7, Aristotle is trying to fit the case of art in the case of nature as well as to explain natural production by analogy with the artificial production.

[53] See *Phys*. 2.1, 193b8–9.

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modate the artificial case. In the following discussion, I shall investigate the passages which shed light on the synonymy principle when it is applied to the case of artefacts, which are found mainly in *Met.* Z 7–9 and Λ, and show how they prove that artefacts have forms. To establish this last point, it is not sufficient to show that the synonymy principle applies to artefacts. As I have mentioned, Aristotle does, in fact, appear to apply some version of the synonymy principle to accidents. If the application of the principle were sufficient to prove the hylomorphic structure of a given item, then Aristotle's application of this principle to accidents would entail that accidents have a hylomorphic structure – a quite contradictory and therefore unhappy result. It is thus crucial not only to point to the application of this principle to artefacts, but also to highlight that it is applied in the following way: there must exist beforehand another substance of the same kind in actuality. I shall divide this task into three steps. First, I shall show that the previously existing substance is the artisan and that they are of the same kind as the object by possessing the same form (Section 4.3.1). Because the form in the mind of the artisan therefore has primacy over the artisan, the second step is to indicate the way in which this form is in actuality (Section 4.3.2). This is not obvious, since scholars have often interpreted Aristotle as stating that the form in the mind of the artisan is in potentiality and becomes actualised in the product.[54] The third step consists in identifying what is in potentiality with the form in the object, rather than with the form in the mind (Section 4.3.3). The fact that the tools used in production represent the stage in which the form in the object is in potentiality is further evidence that there exists such a form.

4.3.1 The Synonymy Principle Applied to Artefacts

In Chapters 7 and 8 of *Met.* Z, the synonymy principle is introduced and exemplified with reference to the case of human beings (Z 7, 1032a24–5 and Z 8, 1033b29–32). Although natural generation is compared with artificial production in these chapters, the reader is not given much information about the manner in which the synonymy principle is able to influence the case of artefacts until the following chapter. In *Met.* Z 9, Aristotle applies the synonymy principle to the coming-to-be of artefacts in two ways: (i) by considering artificial production in quite general terms (1034a21–5); and (ii) by comparing it to coming-to-be from a seed (1034a33–b1). At the present stage, I shall concentrate on the first application of the synonymy

[54] Katayama 1999; Reeve 2000, 60 and 2016, 466.

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principle, which shows that there is a synonymous relationship between the maker and the object, such that they have the same kind of form, because the form in the object is the same as the form in the mind of the artisan. I will address the second application of the synonymy principle in Section 4.3.3, which will show that there is a form of the object in potentiality.

Let us begin with the first passage, which is introduced after Aristotle affirms that some items, such as health, can come about both by art and by spontaneity because the matter involved in the process is such that it can move by itself in the way required. If the matter cannot move by itself so as to make, for instance, a house, the agency of something else is needed. Since stones cannot move in such a way as to create a house, a further agent is needed for a house to come-to-be. At this point, Aristotle states that all things that can come-to-be both by art and by spontaneity come-to-be out of something synonymous:[55]

> It is clear from what has been said that in a certain sense all things (*panta*) [that can come-to-be both by art and by spontaneity][56] come-to-be out of a synonym, just as do the things by nature, either out of a *part* that is synonymous (e.g. the house out of the house, qua by the agency of a mind (*nous*); for the art is the form), or [out of a part] containing some part.[57] (1034a21–5)

How many cases are on the table and under which of the headings does artificial coming-to-be fall? All of the things that can come-to-be either by art or by spontaneity (*panta*), such as health, display the synonymy principle as

[55] A terminological clarification is needed. In 1034a21-5 as well as in Z 9, 1034a33–b1, Aristotle rather mentions homonymy (*ex homônumou* and *homônumon*). However, he means synonymy, because that which generates and that which is generated have the same definition, since, as he says, they have the same form. They do not merely share the same name. Therefore, I have chosen to speak of synonymy in this context, despite the wording in the Greek text as we find it. Another reason for this choice is that I also intend to mark terminologically a distinction between two different topics: on the one hand, the synonymy principle as I am presenting it in this chapter; on the other, the homonymy thesis as the thesis according to which, if some *x* cannot perform its function, this *x* is called *x* only homonymously. I deal with the homonymy thesis in the chapter about the matter of artefacts (6).

[56] Not everyone takes *panta* to refer to the topic of Z 9, namely things that can come-to-be both by art and by spontaneity. For instance, Frede and Patzig (1988) take *panta* to refer to 'all the things that come-to-be' and understand Aristotle to divide the three cases into (i) things by nature; (ii) things by art; and (iii) things by spontaneity. However, this reading runs into serious difficulties. First, the first case does not seem to be in contraposition with the following two. Moreover, even taking the first case as more general, it seems hard to accommodate the natural instance, for the semen cannot be regarded as part, whether of the father (*GA* 724b23–725a3) or of the offspring (*GA* 1.22).

[57] The passage is highly difficult as there are several textual problems. Jaeger and Christ expunge the *ê ek merous homônumou* at line a23 and add *homônumou* to *ê ek merous* at line a24.

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(i) a natural coming-to-be (*hôsper ta phusei*) does. In the case of health, it can come-to-be out of a synonymous part (ii) when it comes-to-be by art, hence the example of the house in the mind of the artisan, for this is a more straightforward instance of something that comes-to-be only by art. If health comes-to-be spontaneously, by contrast, it comes-to-be out of a part containing a part (iii). Aristotle argues that the synonymy principle also works in the case of spontaneous generations. In such a case, the synonymy seems to be between a part$_1$ containing some part$_2$ of the product.[58]

There are two cases on the table, and the case of exclusive artificial coming-to-be corresponds to the coming-to-be out of a synonymous part. The house comes into existence out of something that is synonymous with the house and that is a part of it.[59] As already mentioned, the two synonymous items in a natural generation are the generating and the generated compound insofar as they are the same in form. In artificial production, the two synonymous items are a part of the generating compound and the product. The mind of the artisan is treated as part of the artisan themselves.[60] That is, it is taken as part in relation to the whole-artisan (or to what the artisan ultimately is, namely their soul) rather than to the whole-artefact. Aristotle immediately goes on to provide a pertinent example: a house comes-to-be out of a house, but out of a house qua being in the mind of the artisan (*hêi hupo nou*).[61] The mind of the artisan does not correspond to the artisan themselves as a whole, but constitutes only a part of the artisan.[62] This is also the reason for which the synonymy principle is not obviously applicable in the case of artificial production, but only applies in a certain sense (*tropon tina*). The house does not generate

[58] The way in which the synonymy principle functions in spontaneous generation is far from clear and it is also debated whether the principle holds at all in the case of spontaneous generation. My interpretation is mainly based on the Aristotelian example of health (1034a26–30): *rubbing* and *health* are not synonymous, neither is *rubbing* a part of health. However, *rubbing* contains a part of health, which is the *warmth*, and *warmth* is indeed a part of health. The synonymy stands between the *warmth* contained in the *rubbing* and the *warmth* that is a part of health. Hence, we could say that some things come out of a part (*warmth* in *rubbing*) containing some part (*warmth* of the *health*) of the product (*health*). Of course, *warmth* is not *health*, but *health* follows from it.

[59] There is an ambiguity in Aristotle's formulation. 'Of it' can refer to either the artisan or the house.

[60] Ross (1924, 191–2) believes instead that Aristotle is claiming that the form in the mind of the artisan is merely part of the constructed house, namely its formal part. Ross' reading is supported by the fact that Aristotle identifies *technê* with the *eidos*. However, Aristotle clearly denies that art becomes a part of the product (*GA* 1.22, 730b8–32) and there is another sense in which art is the form (see Chapter 5).

[61] Note that Aristotle here speaks about mind (*nous*), whereas in Z 7 he states that the form is in the soul of the maker (1032b1, 1032b5, 1032b23). Perhaps the choice of mind instead of soul is meant to stress that it is a part, for one could take *nous* to be a part of the soul.

[62] I am referring here to the notion of being in a subject as being a part in the *Categories*.

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a house; rather the house, insofar as it is in the mind of the artisan (i.e. in a part of the artisan), can be said to generate the house. The identification of *technê* with *eidos* does not mean that the form in the mind of the artisan is part of the product (i.e. its formal part). We have previously seen that the form in the mind of the artisan is identified with knowledge, art and the form of the object.[63] It is now possible to understand the identification of the form in the mind (i.e. *technê*) with *eidos* (*hê gar technê to eidos*). This identification explains the level at which there is identity (i.e. the reason for which the synonymy occurs): the form in the mind of the artisan (*technê*) is identified with the form of the artefact produced in order to show the relationship of synonymity between the artisan and the product. Significantly, this is not the first time that Aristotle identifies the art with the form of the object: in Z 7, 1032b13–14, medicine and the art of housebuilding are respectively identified with the form of health and with the form of the house (*hê gar iatrikê esti kai hê oikodomikê to eidos tês hugieias*). The artisan is synonymous with the outcome insofar as they have the form in the mind. Since the form in the mind is the cause of the artisan being synonymous, the form has primacy over the artisan. This state of affairs, however, raises the problem of understanding the way in which the form in the mind is in actuality. While it is intuitive to say that the artisan is in actuality, it seems less intuitive to say that the form in their mind is in actuality. In fact, a common view is that in artificial production the form is first in potentiality in the mind of the artisan and then becomes actualised in the product. In what follows, I shall argue first that – within the framework of the synonymy principle – the form in the mind of the artisan is in actuality (Section 4.3.2); and second that the form in potentiality is rather the one in the object (Section 4.3.3).

4.3.2 *The Form in the Mind of the Artisan as the Form of the Object in Thought and as in Actuality*

Let us distinguish between $form_1$ (i.e. the form in the mind of the artisan) and $form_2$ (i.e. the form of the object). $Form_1$ is like $form_2$ and this grounds the synonymy relation between the artisan and the product as well as Aristotle's identification of *technê* (=$form_1$) with *eidos* (=$form_2$). For the case of artefacts to be like the case of natural substances and not reducible to that of accidents, $form_1$ must be in actuality. When Aristotle affirms that 'it is a this; but this is present potentially, and that is already within his [=

[63] See Chapter 4 (Section 4.1.1).

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the artisan's] power' (Z 7, 1032b20–1), he is often interpreted as saying that the form in the mind of the artisan is in potentiality. Against this interpretation, I shall show here that there is a sense in which $form_1$ is in actuality. Indeed, $form_1$ just is $form_2$ insofar as it is thought. In the next section, I argue that what is in potentiality is not $form_1$, but $form_2$.

The synonymy relation means that $form_1$ and $form_2$ are the same in kind, but this does not necessarily mean that they are indistinguishable in all respects. In the case of living beings, the form of the father in actuality is of the same kind as – but distinct from – the form of the offspring, being first in potentiality in the semen and later in actuality. In the case of artefacts, the form in the mind of the artisan is in actuality as an object of thought. The form in the object has a different *mode of being*. $Form_1$ in the father and $form_2$ in the offspring are simultaneously of the same kind and distinct from each other. $Form_1$ in the artisan and $form_2$ in the artefact are of the same kind precisely because the former is the latter insofar as it is thought. $Form_2$ is even more real, despite a *prima facie* impression that the only true form is the one in the mind of the artisan and that artefacts lack forms, as some say. *Met.* Λ confirms that, strictly speaking, there is only one form, but that this form has two modes of being: the form in the object and this same form as it is thought in the mind of the artisan. In Λ 9, Aristotle mentions productive knowledge in order to highlight a specific characteristic of the relation between thinking and the object that is thought:

> For the act of thinking and the object of thought are not the same thing. In some cases, the knowledge is the object. In the productive branches of knowledge, the substance and essence of the object without matter; whereas in the theoretical sciences, the account or the act of thinking is the object. (1074b38–1075a3)

The form in the mind is the form of the object insofar as it is thought without the matter. The distinction between $form_1$ and $form_2$ is extremely important. $Form_1$ and $form_2$ are two different modes of being of the same form – of which $form_2$ is ultimately more real – but not in the sense that one is the form in potentiality, while the other is the form in actuality. Two problems arise from this.

The first problem is that $form_1$ is identified with essence (1032b2), a notion (e.g. 1032b5) and knowledge (1032b5–6). This suggests that the form in the mind of the artisan is present as a universal. Therefore, one might reject the claim that the synonymy principle applies to artefacts as hylomorphic compounds, because $form_1$ – thus described – cannot exist in actuality, since universals are not in actuality. Now, it is crucial to bear in mind that

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form$_1$ is also described as art. This identification, as I shall show in more detail in Chapter 5, signifies that form$_1$ is an efficient cause. While form$_2$ of a house is the inherent and simultaneously existing cause of the house, form$_1$ can be described as an external, pre-existing efficient cause. Certainly, form$_1$ is an efficient cause as a result of its being possessed by an artisan. In the same way, however, a universal notion, such as knowledge or the definition of a given object, is an efficient cause as a result of being possessed by the artisan. And it is precisely this power that allows a universal to be in actuality. After all, a principle of motion is always and necessarily in actuality. All thought objects are actual in the act of thinking: the form of a house is active in the mind of the artisan *qua* intelligible.

The second problem is the following. Describing the form in the mind as causally and existentially prior to the form in the object and regarding the first as the second insofar as it is thought gives rise to a difficulty: how can the form in the mind be the form of the object insofar as it is thought if the object and its form is not yet there? The form the artisan has in mind is like the form in the object, but it is not identical to it. The form the artisan has in mind is supposedly the form they have come to acquire through experience with other objects of the same kind. Aristotle affirms that the doctor acquires the account of health – and the housebuilder the notion of house – through reason and from sense-perception (*PA* 1.1, 639b16–19). After all, we have seen while discussing the notion of *technê*, that the possession of *technê* implies both experience and understanding.

4.3.3 The Form in the Object in Potentiality: The Artisans' Tools

To understand what Aristotle means by 'it is a this; but this is present potentially, and that is already within his [= the artisan's] power' (Z 7, 1032b20–1), let us focus on the form in the object, whose presence is further suggested by the second comparison between natural and artificial coming-to-be, drawn in Z 9, 1034a33–b1. The form in the father's semen is compared to the form in the artisan's tools in that it represents the stage at which form$_2$ is potentially present. The very fact that there is a potential form$_2$ is additional evidence that the product acquires an inherent form.

> It holds similarly also in the case of things that are composed by nature. For the semen is productive in the same way as the things by art (for it has the form potentially, and that from which the semen is, is in a way synonymous [with the offspring]).

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The production of artefacts is not compared with the coming-to-be of a man out of a man, but to the coming-to-be of the offspring out of the semen. It is not clear, however, how exactly the comparison is supposed to work. In fact, one might say that the two cases are similar in the sense that is stated in the parenthetical remark: there is a potential form, and that from which the form is, is synonymous with the product. But in artificial production what is it that has the form potentially?

The first candidate is the artisan, since they are certainly synonymous with the product insofar as they have the form in their mind. As we said in the previous section, this form is not potential; if it were, this condition would conflict with the claim that art is causally prior and sufficient to explain the coming-to-be of artefacts. Indeed, Aristotle does not provide any explanation for the potentiality of the form in the mind of the artisan and, above all, he never repeats this point elsewhere. As all thought objects are actual in the act of thinking, the form of the house in the mind is actual qua object of thought, qua intelligible. Let us imagine that God has the same forms we keep talking about in mind: it would be extremely odd if such forms in the mind were present in potentiality. The form in the mind, precisely because it is active in the mind of the artisan by being thought and thus serves as principle of motion,[64] cannot be potential.

The second candidate for what possesses the form of the artefact potentially is the matter, because if anything is potentially the produced house, it would be bricks and stones rather than the form in the mind. However, the semen is potentially the offspring in a different way than the body or the menstrual fluid (whatever one takes to be the matter of a living being) is potentially the living being. The semen potentially has the form of the offspring without being matter.

The third candidate is represented by the tools. Aristotle compares the semen both to art and to the tools employed in artisanal production. Which of the two candidates corresponds to the semen in that it possesses the form potentially? In *GA* 1.22, 730b8–32 the semen is compared to art not because it has the form potentially, but rather because both are principles that do not become part of the product. The housebuilding art is not a part of the house just as the semen is not a part of the offspring. In the same chapter, Aristotle compares the semen to an artisan's tool in that the motion generating the product is present in both. The motion of the art is present in the tools employed

[64] In Chapter 5, I will argue that the form in the mind of the artisan is identified by Aristotle with art precisely because it is an external efficient cause.

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by the artisan to the same extent that the motion of nature is present in the semen. Aristotle compares the male nature with the user of a tool, with the user corresponding to the art itself. The tool, by contrast, is compared with the semen:

> The soul, in which is the form, and his knowledge move the hands or some other part in a movement of a particular kind – different when their product is different, the same when it is the same – the hands move the tools, and the tools move the matter. Similarly, also the nature as the one in the male, in those that emit semen, makes use of the semen as a tool which also contains movement in actuality, just like in the productions according to art the tools are in movement; for the movement of the art is in a way in them. (730b15–23)

The semen is said to possess the movement of nature in actuality. On the face of it, one might think this contradicts the idea that the semen has the form in potentiality. Particularly in the biological works, the semen is presented as being equipped with natural motions: such motions are presumably expressions of the father's actual form. If the comparison between the semen and the tools also concerns their respective movements, Aristotle might be expressing the thought that the tools must carry the movement of art in a production. The tools have the $form_1$ in actuality by being the proximate efficient cause that is moving the materials. At the same time, the semen and the tools possess the $form_2$ in potentiality with respect to the product: the semen is not yet the offspring, but rather has the potentiality for the offspring; the tools are not yet the product, but rather represent the extent to which the product is in potentiality.[65] Only once the artisan is present and fully equipped can we say that the matter is potentially the outcome. It follows that when we speak of a potential form in the semen and in the tools, we are indicating a second form, the one possessed by the product, albeit only in potentiality. The tools are similar to the semen in that, through them, $form_2$ is potentially realised. This relation does not go beyond a mere similarity, since the semen is equipped with motions that make the form in potentiality, whereas the activity of the tools merely represents the stage at which the matter can be said to be potentially the product. In this sense, Aristotle states: 'it is a this; but this is present potentially, and that is already within his [= the artisan's] power' (Z 7, 1032b20–1). Once again, mere similarity is the best we can achieve, since the semen (as such) is already equipped with motions that the father

[65] Presumably, the artisan starts adopting the tools only once the matter is available. See Chapter 4 (Section 4.2).

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merely triggers, whereas the tools are equipped with actual movements due to an external cause (i.e. movements provided and structured by the art in the mind of the artisan):

> For heat and cold make the iron hard and soft, but the sword is made by the tools' movement which contains an account (*logon*) belonging to the art. (*GA* 2.1, 734b37–735a2)

The comparison between the roles of the semen and the tools, based on the potentiality of form$_2$, turns out to solve the problem raised in the parenthetical remark. If the way in which the semen has the form in potentiality is not by possessing it, but rather by being able to produce the form on the basis of its natural motions, then this remark could also apply to the case of artefacts. If the artisan corresponds to the father and the tools correspond to the semen, then surely there is a sense in which the tools have the form potentially and that from which the tools are (i.e. the artisan) is synonymous with the product.[66]

Although I have attempted to understand the extent to which the semen is productive in the same way as art, one might still ask why, in Z 9, 1034a33–b1, Aristotle refers to the semen and not to the man. One possible explanation is that Aristotle wishes to clarify the distinction between spontaneous and non-spontaneous generation by pointing to the stage at which the matter, in spontaneous generation, moves by its own agency in such a way as to produce the product in question. This stage is, in fact, that of the movement conferred by the semen.[67] One could also present the question another way. Notoriously, the synonymy principle is predominantly illustrated by means of the example of a man generating a man. However, in the first passage of Z 9, Aristotle does not compare artificial production with the generation of a man out of a man, but rather artificial and natural coming-to-be. The mention of the semen in the second passage of Z 9 is perhaps intended to demarcate a specific case within the class of natural generations. Not all natural generations involve coming-to-be from semen. As we learn from *GA* 1.22, not every male emits semen and the male's nature, in those that emit seed, uses the seed as a tool. The mention of the semen instead of nature in general is meant to point to a narrower comparison between artificial and natural production. The artisan adopts

[66] We can think of this in terms of active *dunameis* as well. A productive *dunamis*, while actual in moving the patient, is not complete until it has done so. The efficient cause, then, can possess the form but still not be fully realised until the corresponding passive *dunamis* (in the patient) has acquired the form. For this angle focusing on active and passive *dunameis*, see *Physics* 3.

[67] More details regarding the agency possessed by the matter are provided in Chapter 6.

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tools through which the form is potentially realised to the same extent that the father's semen functions as a tool that makes the form in potentiality possible.

The second application of the synonymy principle to artefacts is further evidence that artefacts have forms, for the tools represent the stage in which those forms inherent in the artificial objects are potential. However, in the analysis of the *ekeininon* rule in the previous section, I argued that the proximate matter immediately prior to the actuality-inducing action is potentially the object. Thus, the issue is the following: what is it that is potentially the object? Is it the matter or the semen? On my interpretation, both the matter and the tools are potentially, but in two different meanings of 'potentially'.[68] The former meaning applies when the matter is potentially *x* (i.e. when matter is one actuality-inducing action away from being the object). The latter applies when the pre-condition under which the matter is potentially F obtains. *Some matter is potentially a house iff, provided that the housebuilder wills it and there are no external hindrances, the matter will turn into a house*. In other words, the presence of tools represents the pre-condition in which there are no external hindrances.

4.4 Neither Just Matter nor Accidental Beings

Much scholarship on Aristotle rejects the claim that artefacts are hylomorphic compounds, with some commentators endorsing the view that artefacts are merely matter.[69] This view amounts to denying that there is a house and affirming that there are only bricks and stones. Other commentators, by contrast, take artefacts do be more than just matter, but they do not go so far as to defend their hylomorphism.[70] They view artefacts as accidental beings; that is, as matter that has acquired a non-substantial property, which plays the role of a form but is not really a form at all. Thus, for them, there is not a house, but bricks and stones arranged in a house-like manner. This entails that artefacts do not undergo unqualified coming-to-be and that artificial production does not bring anything new into the world. Both views deny that artefacts have proper forms (i.e. that they are hylomorphic compounds). The implicit consequence of this position is that artefact-kinds are merely conventional or mind-dependent and thus far from being as real as natural kinds.[71]

[68] In Chapter 6, I also show that Aristotle at times considers both the semen and the matter potentially the offspring by treating the semen as matter.
[69] Cohen 1996; Shields 2008. [70] Ross 1924, 229; Kosman 1987, 2013; Morel 2015, 2017.
[71] See Bolton 2018, 288–91.

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The interpretation of artificial objects as accidental compounds enjoys widespread support among the ancient commentators. Alexander of Aphrodisias understood forms of artefacts as qualities in opposition to forms of living beings which he identified with substances. Asclepius of Tralles and Michael of Ephesus appear to follow the same line.[72] Despite the undeniable appeal and obvious success of this line of interpretation, I believe that there are strong reasons to resist it. The first is the lack of textual evidence. While there is textual evidence that accidental beings are not substances, there is no evidence that artefacts are accidental beings. The only passage that might suggest this is *Met.* H 2, where the *differentiae* are said to be only analogous to the actualities of substances. I will analyse this passage in Chapter 7, since I agree that these lines are fundamental for our reconstruction of Aristotle's ontology of artefacts. However, as I have argued, the list of *differentiae* includes both substantial forms and accidents. While dinner and breakfast differ in time (i.e. an accident), the *differentia* of a house is composition, and composition – as we have seen – is the kind of actuality-inducing action that allows for the *generation* of a house. Moreover, in modern scholarship, the interpretation of artefacts as accidental beings – when accompanied by a clear account of whether Aristotle endorses a binary or scalar view of substantiality – is associated to a scalar view according to which artefacts are not paradigmatic substances. Nonetheless, also in this regard, I fail to see textual evidence for the view that being accidental unities makes artefacts substances to a lesser degree rather than *not* substances *at all*.

Aristotle's employment of the art analogy, as we have seen, already indicates that artefacts have final causes as their forms. However, on the basis of the arguments proposed in this chapter, I hope to have made a strong case for the hylomorphism of artefacts. If artefacts undergo unqualified coming-to-be, their forms are not mere properties acquired by some material substrate (i.e. they are not accidental beings). Moreover, if artefacts accommodate the *ekeininon* rule, they are not reducible to their matter. Furthermore, the application of the synonymy principle to artefacts plays at different levels on this ascription of inherent forms to artefacts. Thus, artefacts have forms.

The fact that artefacts possess forms does not make them substances. It is possible to have a substantial form without being a substance.[73] An example of this are animal parts. It is hardly possible to take the heart as just matter or

[72] For a discussion of the status of artefacts in the ancient commentators on Aristotle's *Metaphysics,* see Papandreou 2020.

[73] More on the divergence between hylomorphism and substantiality is said in Chapter 7 (Section 7.3.3).

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as an accidental being (e.g. flesh arranged in a certain way). However, as we learn from Z 16, parts of animals fail to reach the level of substances. Moreover, some things can undergo unqualified coming-to-be without entering the realm of substances. Homoiomerous beings, such as ice, undergo unqualified coming-to-be, yet are denied the status of substance. Therefore, artefacts are hylomorphic compounds, but whether they are substances or not is too early to say.

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