Introduction

This book concerns the ontological status of products of art (*technê*) in Aristotle, in particular material objects. It makes three main advances with respect to the existing literature: the first will be of interest to contemporary metaphysicians, the second to historians of philosophy, and the third to both contemporary metaphysicians and historians of philosophy. First, the metaphysics of artefacts is increasingly gaining the attention of contemporary metaphysicians, in particular among supporters of hylomorphism, who all refer to or draw on Aristotle. However, there is no consensus about the place of artefacts within Aristotle's ontology; indeed, there is no consensus as to whether Aristotle articulates a single coherent account of artefacts in the first place. Hence, the first contribution made by this book is to offer a complete picture of Aristotle's account of artefacts that is sensitive to current issues and that can therefore serve as a guide for the contemporary (neo-)Aristotelian debate. Second, when it comes to *technê*, historians of philosophy have primarily focused on the art analogy and Aristotle's use of examples taken from the artificial realm. They have often concluded that Aristotle's appeal to artefacts does not leave us with any positive result about the status of technical objects. To date, little effort has been invested in demarcating Aristotle's notion of artefacts in a way that goes beyond the art analogy and a handful of commonly used examples. The book's second contribution is to show that Aristotle gives a specific, coherent account of artefacts and that he did not merely employ them as examples or analogical cases. Its third and final contribution is to address an issue of key interest to both Aristotle scholars and contemporary metaphysicians concerning the ontological status of artefacts, namely the question of whether they are substances and, if not, why they fail to attain this status. No consensus has yet been reached regarding the substantiality of artefacts: there is agreement neither as to whether artefacts are substances, at least to some extent, nor as to the ultimate reason why they are ontologically inferior to living beings. This book proposes a new solution

to this problem. I shall now begin by offering some preliminary, foundational remarks on the topic and the method.

0.1 Artefacts in the Contemporary Debate

The vast majority of our sensory experience is filled with human-dependent objects. 'Other than the sky and some trees, everything I can see from where I now sit is artificial', as Henry Petroski (1992) puts it at the beginning of his *The Evolution of Useful Things*. Petroski's book aims to examine the way in which such objects have come to look the way they do, by adopting a historical perspective. This perspective is non-philosophical insofar as it presents a sort of common-sense view of artefacts as, in general, objects that are designed – that is, objects from our daily lives employed in specific cultural settings that came-to-be as a result of occasionally rather complicated design-histories. Artefacts are therefore objects that human beings have designed, such as forks, paper clips, hammers, nails and spikes. A similar, yet nonetheless different approach is represented by the archaeological conception of an artefact: something made or given shape by humans, usually found buried along with a body, among votive offerings, in hoards, or in a domestic setting or midden. Examples include stone tools, pottery vessels, metal objects such as weapons, and items of personal adornment, such as buttons, jewellery and clothing. By contrast, neither non-portable remains, such as hearths, nor biofacts and manuports are considered artefacts by archaeologists.[1]

Within a non-philosophical perspective, we find the frequent common-sense identification of artefacts with artworks, such as paintings, drawings and other creative products. Although works of art can, in many respects, be conceptualised as artefacts, they make up only a small portion of this group. A simple semantic shift would suffice to invalidate this identification: common sense does not wholly identify crafted items with works of art. Indeed, the very word 'artefact', in opposition to 'craftwork', allows for a misrepresentation of the class of objects as being artistic products in the ordinary meaning of the term. This is part of the reason why several contemporary thinkers prefer to talk about *technical artefacts* in order to disambiguate and explicitly exclude artworks from their surveys.[2] The adjective 'artificial' exhibits similar ambiguity. The ordinary understanding

[1] Biofacts are objects that are merely handled by humans but not made by them. Usually biofacts refer to the residual material of a formerly living being. Manuports are natural objects that humans have moved, but not changed.

[2] See Baker (2007).

of this term takes it to mean either 'made according to art'/'man-made' or 'not sincere'. Thus, the replacement of 'artificial' by either 'crafted' or 'technical' helps to avoid ambiguity. In this book, I shall employ the word 'artefact' – and, consequently, 'artificial' – to refer to a class of human-dependent objects that are typically brought into existence through a specific set of skills (i.e. art or craft).

If we define artefacts as both artistic and technical items that are brought into existence by human agents, why are they interesting? From an ordinary point of view – without yet entering into philosophical discussion – artefacts are interesting because nobody can do without them. Of course, one could very well take the decision to push technology out of one's life, but technical items are far more numerous than technological items, such as smartphones, computers and consoles. The world we live in is filled with roads, beds and tools. Anyone interested in the world would have to acknowledge the vast quantities of artefacts present in it. Even when not acknowledged, artefacts play a major role in shaping societies and people's lives.[3]

The omnipresence of artefacts has been widely underestimated by philosophers and interest in technology is a recent development. Two branches of philosophy have shown the most interest in artefacts: philosophy of technology and aesthetics. The former emerged as a discipline over the last two centuries and was primarily associated with questions of philosophy of science and engineering.[4] The latter was specifically engaged with questions regarding works of art, leaving aside tools and other objects of this sort that constitute the majority of artefacts.

The metaphysics of artefacts has received comparatively limited interest.[5] This is probably due to a tradition that downgrades manifest things[6] and denies the value of artefacts. One contemporary controversy has, in fact, focused on whether artefacts deserve a place in our ontology at all. The idea that artefacts might deserve their own ontological position has often been rejected. Puzzles such as that of Theseus' Ship[7] or the problem of coinciding

[3] For a discussion on the ways in which well and badly designed artefacts affect our lives, see, for instance, Norman 2001; and for a consideration of artefacts as 'collaborative actions', see Preston 2012.

[4] It is still difficult to understand what the discipline of philosophy of technology consists of and whether it is a self-contained discipline in the first place. For an overview, see Franssen 2009; Reydon 2012.

[5] I shall set aside the treatment of artefacts in semantic, mereology and formal ontology.

[6] In the modern discussion, the class of 'manifest things' includes macroscopic beings such as artefacts and living beings.

[7] The puzzle of Theseus' Ship has acquired special notoriety. It is presented by Hobbes in his *De Corpore* (1655) and reconsidered by Simons (1987) and Wiggins (2001).

objects[8] seem to threaten their identity and existence. The so-called 'Denial Thesis' proposed by Van Inwagen (1990) has been highly influential, according to which not only artefacts, but also inanimate material objects do not exist.[9] This scepticism about taking artefacts seriously may also reflect a more general scepticism towards ordinary things (natural as well as artificial beings present in our daily experience – such as dogs and chairs) of the sort that we find, for instance, in Unger's (1979) article. As Baker (2007, 4–5) states:

> Some contemporary metaphysicians reject ordinary things[10] because they take irreducible reality to be exhausted by a completed physics; some reject ordinary things because they take common sense objects to be too sloppy – they gain and lose parts; they have no fixed boundaries – to be irreducibly real. Many of today's philosophers take concrete reality to be nothing but fundamental particles and their fusions, or instantaneous temporal parts, and/or a few universals, and see no ontological significance in ordinary things like trees and tables.

Baker is therefore part of the minor trend of taking ordinary things to be irreducibly real and, hence, as deserving a spot in our ontologies.

However, growing interest in artificial objects has also been witnessed recently in metaphysics, where the main questions are about the kind of entities they are and whether they exist at all – since their identity conditions seem unclear with respect to both particular objects and artificial kinds. Metaphysics has mostly focused on works of arts alone, and especially on the question of the ontological category to which they belong. Many philosophers have, in fact, defined works of art as events, processes or actions.[11] The metaphysics of technical artefacts, or artefacts in general (including both technical artefacts and artworks), has certainly received a limited attention due to widespread scepticism about their metaphysical value. However, two leading approaches to defending artefacts as serious objects of philosophical thinking have been promoted in recent years. The first is to reject the arguments against the ontological value of artefacts. Thinkers following this first path include Rea (1995, 1998) and Soavi (2009).[12] The second way of securing a place for artefacts within our

[8] See Rea 1997.

[9] By proposing a theory of composition, Van Inwagen claims that only living beings and their simples exist.

[10] The class of ordinary things is broader than the class of artefacts. Ordinary things also include living beings. Some philosophers do not merely exclude artefacts from ontology, but they do so by excluding ordinary things as a whole from their discussion.

[11] For an overview of the positions concerning the ontological status of artworks, see Livingston 2011.

[12] Soavi (2009), for instance, examines and rejects three arguments against the reality of artefacts: Wiggins' argument that artefact kinds are not sortals (Wiggins 2001), Van Inwagen's composition

ontology is to defend the value of a super-category that includes artefacts, as well as other things.[13] Often, this latter approach is pursued alongside the rejection of arguments levelled against the super-category in question. For instance, Elder (2007) includes some – though not all – artefacts in the class of *copied kinds* and argues that they 'have genuine, mind-independent existence – existence caused by us, to be sure, but not constituted by our believing what we do about where artifacts are to be found'. Thomasson (2007a) includes artefacts in the super-category of *ordinary objects* and argues in favour of a realist position, by opposing the idea that dependence on human beliefs and intentions cannot coexist with the reality of artificial and institutional objects. Baker focuses on the super-category of *familiar things* and defends their value: she explains that the everyday world is the locus of human interest and concern (Baker 2007, 7) and that it figures in the causal explanations that we make. Also in favour of the reality of artefacts is Koslicki,[14] who declares her willingness to include artefacts in her discussion, despite being sceptical as to whether they can be counted as hylomorphic compounds. While still constituting a minority, supporters of taking artefacts seriously in metaphysical discussions have been growing in number and strength in recent years. It seems that the complaint made by Houkes and Vermaas (2009) about analytic philosophers of artefacts was not unheard: 'Only those philosophers who aim at a very complete and/or a very general understanding of the world care, at some point in their projects, to examine artefacts.' A prominent, but unwelcome feature of analytic studies of artefacts is their lack of specificity: they touch upon artefacts merely because they are dealing with a larger range of beings, if not all beings. On the one hand, numerous works have associated artefacts with a range of other beings, so as to create a more general class of beings sharing a particular metaphysical feature: examples of this include copied kinds (Elder 2007) and ordinary objects (Van Inwagen 1990). On the other hand, some works have focused on specific kinds of artefacts, such as artworks, or have discussed artefacts without drawing a distinction between artefacts and other human-dependent things, resulting in the wider class of ID-objects. Analytic metaphysicians of artefacts have mostly addressed them in

argument (Van Inwagen 1990, 90, 98) and Merricks' argument from causal overdetermination (Merricks 2001, 56–8). She argues (29–30) that the three accounts suffer from the same fundamental flaw: none of them establishes a clear-cut distinction between artefacts and natural beings. More recently, Koslicki (2018), while addressing author-based accounts, points out their difficulties in dealing with objects that are clearly classifiable neither as natural beings nor as artefacts.

[13] Works defending the metaphysical seriousness of artefacts include Rea 1995, 1998; Thomasson 1999, 2007; Elder 2004, 2007.

[14] Koslicki 2008, 2018.

what Houkes and Vermaas (2009) call the 'detached way', on the grounds that 'artefacts are compared with objects that are independent from human interests or it is examined whether artefacts are sufficiently independent to qualify as objects or as members of a natural kind'. Only more recent developments have given rise to an 'involved perspective', in which our involvement with objects is taken as relevant to their real nature. Philosophers such as Baker, Thomasson and Elder place intention along with actions such as design, production and modification at the centre of their enquiry.

However, even among thinkers who are willing to include artefacts in their enquiries there are controversies, in particular about the definition of the class of artefacts and the essence of a given artefact. As regards the first controversy, an initial definition of what an artefact is supposed to be is provided by Hilpinen (1993), who identifies an artefact with an object that has an author. In the same year, Dipert (1993) described an artefact as something intended by its author to be recognised as having been intentionally made for a certain purpose. However, both focus their attention on artefacts that are works of art. By contrast, a definition of artefacts, in the sense of technical artefacts, is advanced by Thomasson (2003, 2007), who defines artefacts as intended products of human activity. The discussion concerning the definition of the class of artefacts (i.e. of what things are artefacts) has occasionally overlapped with the debate about how to pinpoint the essence of a given artefact. This overlap is primarily due to the predominant identification of artefactual essences with the author's intentions or acts: the definition of an artefact as something produced for a given purpose coincides with the artefact's essence as 'being produced for the purpose *K*'. It is too often the case that the extensional question concerning precisely what things are to be counted as artefacts is confused with the question of the essence of a given artefact; that is, of how artefactual essences ought to be conceived. At any rate, artefactual essences have been singled out in several different ways. Most essentialist accounts identify these essences with the maker's intentions.[15] As has already been mentioned, Thomasson claims that the author's intentions are constitutive of artefactual essences, hence artefacts are essentially mind-dependent human products. Baker (2007) describes the essences of technical artefacts as *proper functions*, namely the practical goal that the object is supposed to achieve. Elder (2004, 2007) speaks about functions as well, but he does so from a historical perspective in which they are copied from earlier products

[15] I leave aside conventionalist accounts. For an overview, see Koslicki 2018, 237–9.

of the same kind. In his view, an artefact's essence includes the production of certain effects. More recently, Evnine (2016) has identified artefactual essences with acts of creations: an act of creation involves the agent performing the action, as well as the events underlying the action, such as bodily movements and other actions. Another angle is provided by Kornblith (2007), who suggests that a given artefact's essence might be redefined by subsequent user intentions, as opposed to the original maker's intentions.

In addition to the two major disputes about artefacts, in the current metaphysical discussion, hylomorphic accounts are open to several other challenges, which are highlighted by Koslicki (2018). One challenge is what Koslicki calls the 'easy ontology' challenge, consisting of the following problem: if the intentions of the maker are sufficient to bring about a new object, it appears 'too easy' to create not only new items but also new *kinds*. According to this challenge, not only biofacts, ready-mades and found-objects, but also a potentially endless number of prototypes might come to populate our world. Another challenge is called the 'scope' challenge and concerns the ontological status of things that are neither natural nor qualify as artefacts; for example, animal artefacts, by-products, residues and unintended products of human activity. The lack of a clear definition of the class of artefacts is a real problem with in the contemporary debate and ultimately influences the ontological question regarding such entities as well.[16] Aristotle provides us with conceptual tools to deal with such challenges.[17] Moreover, Aristotle provides a definition of the class of artefacts that marks them off from both the class of ordinary objects and the class of human-dependent objects.

Baker (2007, 5) declares that Aristotle was quite the exception in the history of philosophy, in that he was willing to accommodate artefacts within his ontology. Aristotle was arguably the first philosopher to make such large-scale use of artefacts and, more important, to include them in specifically metaphysical discussions. Moreover, he did so in an 'involved way'. Today, several metaphysicians either call themselves Aristotelian, or are supporters of hylomorphism, or again they draw on Aristotle for some of their claims. In order to side with Aristotle, however, one requires a clear overview of Aristotle's account of artefacts and the main propositions it advances.

[16] See Soavi 2009, 29–30.

[17] For a discussion on how Aristotle would face the challenges highlighted by Koslicki (2018), see Papandreou 2018.

0.2 Artefacts in Aristotle: Some Preliminary Observations

The topic of artefacts is currently debated by contemporary philosophers to the same extent that it was traditionally understudied by historians of philosophy. Despite excellent work on the notion of *technê*, which has been chiefly surveyed up to the Hellenistic age,[18] comparatively little attention has been dedicated to artefacts. Considering that the current debate on artefacts flourished within an Aristotelian framework, it is all the more striking that most work done by historians of ancient philosophy on artefacts concerns ancient Platonism.[19] In particular, the debate within the Academy about whether there exist Ideas of artefacts has received deserved attention.[20] Moreover, the same controversy has been studied in Late Antiquity, especially with reference to Proclus and Syrianus.[21] However, Aristotle and the history of Aristotelianism has, surprisingly, not received the same attention. The only book-length discussion of artefacts in Aristotle is Katayama's (1999). The other contributions by Aristotle scholars only touch upon artefacts, rather than focusing on them. Moreover, like most contemporary metaphysicians, Aristotle scholars primarily address artefacts by including them in a super-category worthier of explanation. For instance, while for Cohen (1996) the super-category of interest is that of 'incomplete substances', for Kosman (1987) it is 'animals and other beings'.

Before diving into Aristotle's conception of art, the resulting inventory of Aristotelian artefacts and the issue of their ontological status, it is important to mention certain difficulties concerning the method and the nature of such an investigation. For instance, the reader might reject the project at the outset, because it supposedly lacks a subject-matter. Above all, while Aristotle has a specific term for referring to art or craft (*technê*), he lacks a single term to signify 'artefact'.[22] This semantic deficiency gives rise to general issues, the main one being whether he really deals with artefacts at all. The Latin word *artefactum* comes from the ablative of *ars*, meaning 'by skill', and the past participle of *facere*, meaning 'made'. Aristotle does not have such a term at his disposal in Ancient Greek. However, there are

[18] See, e.g. Isnardi Parente (1966) and Löbl (1997, 2003, 2008). The most recent contribution to the topic is Johansen (2021), which covers the notion of productive knowledge in ancient philosophy up to Late Antiquity, with a chapter on Plotinus and one on Proclus.

[19] I am referring to contributions concerned with artefacts as such. Certainly, there is a vast literature on the art analogy and teleology. I will return to these aspects in Chapter 3.1.

[20] For example, Fine (1993) and Broadie (2007). [21] D'Hoine (2006a, 2006b).

[22] This is not the case for Aristotle's commentators. Already with Alexander of Aphrodisias, *ta phusika* (natural beings) are opposed to *ta technêta* (artefacts). See, for instance, *Mantissa* 121.17–18.

certainly clauses that correspond to 'artefact'. First, 'being by nature' (*phusei*) is often opposed to 'being by art' (*technêi*). As opposed to 'being nature' (*estin hê phusis*), which is being the sort of principle that nature is, 'being by nature' refers to the things that have such a principle. Similarly, 'being by art' refers to those things whose principle is art (*technê*). In the case of natural beings, 'being by nature', in turn, coincides with 'having a nature' (*echei phusin*).[23] In the case of artefacts, 'being by art' does not coincide with 'having art'. However, 'being by art' is as close to 'being in accordance with art' (*kata technên*),[24] as 'being by nature' is to 'being according to nature' (*kata phusin*). The difference in both cases is that 'according to' applies to substances, as well as to properties, whereas 'being by' seems to refer only to substantial cases. Aristotle refers to artefacts as beings *kata technên*, especially in the *Physics* and in the biological works.[25] Another way to refer to artefacts is as *to technikon*, in the sense of 'done by rules of art' – and not in the sense of 'skilful' – which is a parallel construction to *to phusikon* (i.e. 'caused by nature').[26] Things that exist by art are often qualified as things that have been put together *apo technês*.[27] In several places, Aristotle drops the mention of *technê* and refers to *phusis* in a negative sense: he speaks about things that are not put together by nature, referring to things such as a vessel, a house, a couch, a coat and a ship.[28] A broader term, encompassing artefacts, as well as other products that are not natural, is *poioumena* (i.e. things that are made).[29] This term can refer to artefacts, as well as other things resulting from production, as well as to productive branches of knowledge. Aristotle explicitly refers to art in *NE* 1014a10–16. In *Phys.* 2.1 *poioumena* refers to artefacts, such as a house, as well as to manufactured objects (*cheirokmêta*).[30] By 'manufactured objects', Aristotle seems to mean items an unskilled maker could build, such as a well.[31] This intuition is confirmed by *Met.* A, where the term refers to the things produced by mere manual workers (*hoi cheirotechnai*).[32] Moreover, in several places in *GA*, Aristotle refers to artefacts or to the works of Nature when comparing it to an artisan as

[23] *Phys.* 2.1, 192b27–193a1.
[24] Aristotle appeals to *kata technên* for instance in *NE* 1099b22–3; *Met.* 1070a17 but also in *Protrepticus* fr. 12 line 8.
[25] *GA* 730b21, 734b36, 767a17 and 775a21; *PA* 639b15–16; *Phys.* 193a32, 194b7, 199a17–19, 199a33, 199b1, 200b1.
[26] *Phys.* 2.1, 193a31–3.
[27] *Cael.* 277b31, *GC* 335b28, *Met.* 1032a27–8, 1032a32, 1032b22–3, 1032b24–5, 1034a12, 1034a34, *PA* 640a29, 640a32, *Phys.* 2.1, 192b18 and *Protrepticus* fragment 12 line 2.
[28] In *Met.* 1043b22 and *Phys.* 192b13, 254b31. [29] *Met.* 1050a31, 1064a12.
[30] *Phys.* 2.1, 192b27–32. [31] *Meteor.* 353b25–6, 381a30. [32] *Met.* A 1, 981a30–b2.

'things that are crafted' (*dêmiourgoumena*).[33] Also things that come-to-be *apo dianoias*, such as, for instance in *Met.* Θ 7, 1049a5, demarcate the class of human-dependent beings which is broader than the class of artefacts. One might add to this list the term for 'inanimate', since, from the standpoint of its meaning, it seems to designate a place for artefacts, since artefacts are, in fact, inanimate objects. However, Aristotle mostly uses the adjective *apsuchos* to refer to inanimate natural beings, such as copper and silver, whose main difference with respect to living beings is their lack of sense perception (*Phys.* 244b13).[34] The Aristotelian *scala naturae* is a continuum ranging from those inanimate natural beings considered as lifeless (*apsucha*) to animals[35] (i.e. those beings most fully endowed with life), by way of plants, which represent the bridge between the non-living and the living (*HA* 588b6–10, *PA* 681a13 and Theophrastus *On Plants* 1.1, 816a35). Leaving aside the adjective *apsuchos*, Aristotle has several alternative ways of referring to artefacts and the one this book is most interested in is 'being *technêi*', which defines substance-like cases of things made by art. Common sense regards substance-like cases (i.e. material objects)[36] as paradigms and this book, too, focuses on such cases (i.e. those cases that would count as substances in the *Categories*). While material objects are certainly not the only products of some art, since it has been shown that being according to art is a broader concept, the notion of interest here is that of material objects as substance-like cases.

For this reason, the *Categories* will be briefly discussed here, since art is trans-categorical. The first feature of substances is a negative one: they are not in a subject, but they are subjects of predicates. Something can be predicated of a substance, but a primary substance cannot be the predicated of anything. An artefact that falls under the category of substance is thus the subject of predication and not a predicate. This first crucial feature of substances eliminates from consideration all properties that are brought about by art. If a doctor makes the patient healthy (i.e. brings about a qualitative change in them), then the patient's health is not the kind of artefact we will be dealing with here. The second feature of substances is that each is a *tode ti* (i.e. *this* particular thing). This feature applies to primary substances, since they are individual things that are numerically one. Secondary substances are rather said to be *poion tina*: man is said of

[33] *GA* 724a34, 743b23, 762a16, 767a19. See also *NE* 1094b14.
[34] Mostly but not always, since, for instance, in *Met.* Δ 12 on the meanings of capacity (*dunamis*), Aristotle uses it to refer to tools.
[35] Between animate and inanimate there is no intermediate state. See *On Plants* 1.1, 816a5–10.
[36] On products of art that do not qualify as material objects, see Chapter 3 (Section 3.3).

many men; thus, it does not refer to one individual thing. Our journey into the realm of artefacts will be guided by a focus on items that are individual and numerically one. Another feature of substances is that each substance admits contraries (i.e. undergoes changes) while still remaining identical to itself and numerically one. This feature is exclusive to substances. Any spatially extended object can undergo changes from one contrary to the other, while remaining what it is. When Aristotle, at the end of *Cat.* 5, repeats this necessary and exclusive feature of substances (i.e. that they admit of contraries), he says that a substance can remain what it is even when changing from disease to health, or from whiteness to blackness.[37] It is noteworthy that health is mentioned here. This gives us further reason to locate it within another category and, more specifically, under the category of disposition: health can easily be removed and can quickly change. By contrast, habits such as virtues and vices are more difficult to change, and they are generally stable and long-lasting. Certainly, in this passage, as well as in others in the *Categories*, Aristotle introduces health without any concern about its origin: whether health occurs spontaneously or by art is unimportant; what is important is that health is always the health of something else (i.e. of a substance). However that may be, the last and most relevant criterion rules processes out of consideration. Given the three main aspects of substance, only some of the various things that can be brought about by art pass the test for substantiality in the *Categories*. These things therefore represent the focus of my enquiry: spatially extended (concrete) individual objects such as tools, garments, furniture and craft-works. Things that fail the test of the *Categories* are properties, such as health, events/processes, such as boiling, and states of mind, such as persuasion and agreement: these will all be set aside.[38] Note that this book does not argue for the exclusion of health and persuasion from the class of genuine artefacts, but rather for the exclusion of such things from the scope of the present enquiry. As we have said, art is trans-categorical: health is a property brought about by medicine, while persuasion is an affection of a subject produced by the art of the orator. These things are all products of art in that they come-to-be by art. This means that one should not ascribe to Aristotle the view that artefacts are substance-like. Since a considerable part of the effort of this book is dedicated to situating artefacts within ontology and understanding the extent to which they are not proper substances – if they are even substances at all – this book, methodologically speaking, excludes from consideration those things that

[37] *Cat.* 4b13–9. [38] I shall briefly address them again in Chapter 3 (Section 3.3.1).

could potentially produce confusion. In other words, if one focuses on health as the reference case, one might end up excluding all artefacts from the realm of substances for the wrong reasons, because health fails to be a substance, first and foremost, because it is a property and not because it is an artefact. The focus is therefore on those things that, according to the *Categories*, would count as substances in order to see whether they continue to be substances within the framework of the *Metaphysics*.

Another objection might derive from the undeniable fact that Aristotle did not dedicate any specific work or extended, well-structured argumentation to artefacts.[39] This might mean that he was not interested in artefacts and/or that he did not find them sufficiently problematic. Certainly, there are works dedicated to arts, such as the *Rhetoric* and the *Poetics*, but none that specifically deals with artefacts in the way specified.[40] Diogenes Laertius lists among Aristotle's works of 'excellence' two compilations of *technai* composed of two books each, and a work on *Technê* in one book. We do not know the content of these works, but it seems again that the primary focus is the art rather than its products.[41] The closest we get to a work concerned with artefacts – or, at least, with their physical behaviour – is the *Mechanics*, whose authorship is highly disputed. By contrast, Aristotle's interest in animals is obvious from the enormous efforts he dedicated to them and the undeniable fact that he established biology as a discipline. Why did he not dedicate one-tenth of this effort to artefacts? One immediate, simple answer is that Aristotle was more interested in what he regarded as axiologically superior beings. He was more interested in living beings, especially animals, than in inanimate beings. It is thus no surprise that he did not display a fiery passion for coats and cups. However, although Aristotle did not write a treatise on artefacts, he was clearly puzzled by them. His teacher Plato had made use of some aspects of artificial production, but he clearly did not have any philosophical reason to concentrate on them. The Academy debated the existence of Ideas of artefacts, but only in order to buttress the Platonic theory of forms. Indeed, another reason why he does not set out his views on artefacts has to do with Plato, for Aristotle can readily assume some points made by Plato to then

[39] One might say that the so-called 'chemical treatise' (i.e. *Meteor.* 4) concerns artefacts at a chemical level. However, the focus is on chemical processes, irrespective of whether they are brought about naturally or artificially. Moreover, as I will argue in Chapter 3 (Section 3.4.2), the homoiomerous bodies are natural beings, even the ones produced by art.

[40] For a brief discussion of the products of arts such as rhetoric, poetics and politics, see Chapter 3 (Section 3.3.1).

[41] For a conjecture on the possible content of such works, see Bolton 2021.

set up analogies. Aristotle is possibly the first philosopher to take up artefacts and to try to situate them in an ontology. Although he did not address artificial objects at length or in depth, it is still of interest to a modern reader to know what the Aristotelian answer to the problems posed by artefacts would be. This book thus aims at delineating the best theory that Aristotle could be committed to given his explicit statements on the matter.

Aristotle has no single and consistent term for artefacts, no extended argumentation and no work dedicated specifically to the metaphysical status of artefacts. If this were not enough, he often merely uses artefacts to shed light on more important cases. As a result, scholars have often concluded that Aristotle employs artefacts only in order to shed light on cases of greater worth and interest, but that there is no theory of artefacts that we can extrapolate from this. However, despite Aristotle's often pedagogical use of artefacts, there is, in fact, a theory lying behind these examples. In order to see the broader picture, it is important to outline the contexts and the discussions in which artefacts show up and to understand their significance. Why does Aristotle mention artefacts? To what extent are they merely tools for understanding something else? Is there room for a specific analysis of artefacts?

In general, Aristotle's use of artefacts can be divided into two groups: positive and negative. By positive use, I mean those cases in which artefacts are used to draw attention to a similarity between them and natural beings, or more general principles. The positive use of artefacts includes both the art analogy, which is employed to draw conclusions about the natural realm, and the use of artefacts as examples to illustrate a certain general principle or notion. By contrast, negative use corresponds to those cases in which Aristotle emphasises the differences between artefacts and natural beings, in order to highlight the unusual character of artefacts, or more generally, human-dependent objects.

As regards the positive use, the art analogy has both methodological and epistemological value.[42] Structures and mechanisms that are not clearly recognisable within the natural world are brought out by means of the analogy with art. Of course, this strategy provides some information about artefacts, but it also has the side-effect of downgrading artefacts and encouraging scholars to see them as having little importance. Indeed, artefactual models are employed mainly to highlight the teleological structure in the natural world that would otherwise be difficult to grasp.[43] Since

[42] I discuss the implications of the art analogy in Chapter 3 (Section 3.1). [43] Sedley 2010.

art imitates nature, one can move from art to nature in order to understand the latter better. The main result of this strategy is deployed against the materialists: there is a final cause and it has priority over the efficient cause.[44] In *Physics* 2.8–9, the task seems to be to show that the material cause is insufficient and that an appeal to their material constituents alone falls short of giving an account of organisms and what is best for them.[45] The examples provided by artefacts are helpful because they more clearly display the distinction between the four causes, particularly the importance of the final cause and the relation of hypothetical necessity involving the material cause. The causes of artefacts are clearer not so much because the objects at issue are inanimate (as we shall see, this feature is helpful for other purposes), but because they are created by humans. Artificial production is a man-made process that is clearly guided by the final cause (i.e. the goal the artisan aims at). The example of man does not show the distinction between the four causes with the same degree of clarity. However, although the final cause is most evident in the operation of arts, it might turn out that teleology applies to living beings more fully than it does to artefacts.

Examples constitute a different case of the positive use of artefacts. Artefacts are often employed to clarify principles that might be difficult to grasp, whether these principles apply to natural things as such or to a broader range of things. Notoriously, Aristotle often appeals to the method according to which we should start our inquiries from what is better known to us and move towards what is less known to us, but more evident in itself. Artefacts are therefore employed, for instance, to illustrate several metaphysical principles (e.g. the theory of actuality and potentiality or the theory of form and matter). Especially in the *Metaphysics*, Aristotle uses artefacts as examples in order to clarify the distinction between matter and form.[46] The examples are only partially adequate, since the relation between form and matter in artefacts is different than in living beings.[47] The second positive way in which artefacts are used is highly slippery since, most of the time, it is difficult to use these examples in order to account fully for the substantial case of living beings. Examples drawn from artefacts fall short of fully representing the best substances, such as animals, but might still be helpful because they are inanimate and, hence, form and matter are more clearly distinguished. Examples serve as the basis for inductions: the general principle that Aristotle intends to illustrate might

[44] For a more detailed discussion, see Vattimo 1961; Cardullo 2005. [45] Quarantotto 2005.
[46] Waterlow 1982. [47] This topic will be addressed in detail in Chapter 6.

work differently when applied to substances. In this sense, the vertical line from the example to the general principle can be misleading: while the art analogy starts from an obvious truth about artefacts, artefactual examples start from a principle that can be presented in this way, but that might be fully true neither of the artefacts nor of substances (or whatever is at issue).

As regards the negative use of artefacts, Aristotle does not always mention them as mere undistinguished tools that help to shed light on something else more worthy of explanation. In some passages, he seems to mention artefacts in order to make a point about their specific character or to highlight the extent to which they differ from something else, and primarily from natural beings. These passages constitute a precious source of information. When Aristotle clearly identifies a distinctive trait of artefacts, such as their lesser degree of unity, we can be more confident that the information is not misleading and that we are learning something specific about them. The definition of nature in *Phys.* 2.1 is an illuminating example: Aristotle draws a distinction between natural and non-natural beings that is of crucial importance. Throughout the *Metaphysics*, we can spot this negative use of artefacts several times, which is employed to mark a contrast with natural or living beings. In some places, Aristotle also distinguishes artefacts from other things that have come-to-be spontaneously. I shall not appeal to artefacts insofar as they are used as examples to provide evidence for my claims. When I appeal to the positive usage, this will only regard the art analogy. By contrast, the negative use of artefacts is wholly embraced as a source of information exclusively concerning artefacts or, more generally, human-dependent objects. The negative and informative usage will be employed within the framework of crucial discussions, such as of coming-to-be, the unity between matter and form and the unity between parts and whole. A chapter will be dedicated to each of these topics.

0.3 Aristotelian Scholarship: The *Status Quaestionis*

Contemporary metaphysicians debate the existence, the essence and the identity conditions of artefacts, which demonstrates a philosophical interest in them. However, this did not emerge spontaneously in contemporary philosophy without any antecedents. One of these forerunners, and perhaps the first one, was Aristotle, who is quite exceptional in the history of philosophy in that he was not only interested in artefacts, but also willing to situate them in his ontology.

The main question addressed within the Aristotelian metaphysical debate concerns the substantiality of artefacts.[48] Scholars agree that material artefacts, such as tables and chairs, are substances within the framework of the *Categories.* Regardless of whether we endorse an ontological or a linguistic interpretation of the *Categories*, we would still place artefacts in the category of substance, since a table is both concrete particular and subject of predication. Besides, if artefacts did not belong to the category of substance, it is not at all clear where else in the schema they would fall. But things get trickier with the *Metaphysics* since there is consensus about the metaphysical deficiency of artefacts in comparison to living beings. All scholars agree that artefacts are not substances to the highest degree and that for Aristotle substances are, in the first instance, living beings. When Aristotle presents catalogues of recognised substances, he does not mention artefacts. Δ 8's overview of the notion of substance mentions elements, simple bodies, animals, divine beings and their parts (1017b10–13). In *Met*. Z 2, 1028b8–13 recognised substances are bodies, such as animals, plants, their parts, elements, bodies constituted by the elements and heavenly bodies. *Met.* H 1's catalogue of recognised substances includes natural substances, such as the elements, plants (and their parts), animals (and their parts) and the heavens (with its parts) (1042a7–11).

However, there are two points of disagreement. The first has to do with whether one espouses a binary or a scalar view of substantiality. On the binary view, something either is or is not a substance: thus, artefacts are not substances *at all*. By contrast, on the scalar view, something can be more or less of a substance: thus, artefacts are not *paradigmatic* substances.[49] Advocates of a binary view emphasise those passages that seem to exclude artefacts from the class of substances. In Z 17, Aristotle states that those things that are substances are constituted in accordance with and by nature (1041b28–32). In H 2, he defines the *differentiae* of several human-dependent objects as merely analogous to the actualities of substances. In H 3, 1043b21–2, he says that it is perhaps the case that only things put together by nature are substances. In Λ 3, 1070a18–19, Aristotle applauds

[48] In focusing on the metaphysical debate, I am consciously leaving aside contributions concerning the art analogy, such as Scharle's (2015), and the usage of artefacts in other disciplines, such as Angier's (2010).

[49] We learn from the *Categories* that substance does not admit of the more and less (3b33–4). One way of understanding the scalar view is *not* compatible with what we find in the *Categories*; another is compatible. The former merely states that something is more or less of a substance; the latter argues that every substance is equally a substance but certain substances satisfy the criteria more fully (Shields 2008, 132 n. 8).

Plato for positing Ideas of living beings alone.[50] By contrast, advocates of the scalar view draw attention to passages where Aristotle seems to suggest that there are degrees of substantiality. In *Met.* Z 7, 1032a18–19, Aristotle affirms that human beings and plants *most of all* (*malista*) appear to be substances. In Z 8, 1034a3–4, he refers to human beings who generate human beings as instances of substances in the fullest sense. Furthermore, in *Met.* Z 11, he asserts that the soul is primary substance.[51]

The second point of disagreement concerns the reasons why artefacts do not qualify as paradigmatic substances or substances at all. Several different answers have been given, with the same answers sometimes being proposed by both supporters of the binary and supporters of the scalar view. Among those embracing the binary view (i.e. those who deny any degree of substantiality to artefacts), we find Katayama's (1999) *Aristotle on Artefacts*, the only book-length discussion of artefacts in Aristotle. Katayama focuses on whether artefacts are substances at all and answers in the negative, setting up eternity and actuality as criteria of substantiality. Although this problem is raised in the *Metaphysics,* Katayama argues that the solution is to be found in the biological works. His solution, however, excludes from the class of substances not only artefacts, but also those animals that are unable to reproduce, since the criteria of substantiality are actuality and eternity. Hence, the only substances will be God, the heavenly spheres and those animals and plants that are able to reproduce (i.e. that are able to partake of the eternal and the divine). The same solution, which excludes artefacts and some living beings from the ranks of substance, is also presented in an article by Katayama (2008), in which the main criterion of substantiality is unity. Katayama thus downgrades artefacts to mere things (*pragmata*). It is important to stress that, with the exception of Katayama, Aristotle scholarship for the most part merely touches upon the problem of artefacts without thematising it as a central concern.[52] For instance, Ross (1924), commenting on the passage from H 2, links the non-substantiality of artefacts to the idea that forms of artefacts do not belong to the category of substance. A similar solution is proposed by Morel (2015), who at first seems to deny the presence of a form in artefacts, before ascribing to the forms of artefacts an intermediary status

[50] Outside the *Metaphysics*, one possible relevant passage is – according to Shields (2008) – *Phys.* 2.1, 192b32–4. However, as I will explain in the Section 0.4, the *Physics* does not engage in metaphysical questions.

[51] Outside the *Metaphysics*, in *DA* 2.1, Aristotle states that bodies seem most of all to be substances, particularly natural ones, since they are principles of the others (412a11–13).

[52] Exceptions include Gerson (1984), Koslicki (1997), Morel (2017) and Corkum (2023).

between matter and proper substantial form (Morel 2017).[53] Among the supporters of the binary view, we also find Lewis and Shields. Lewis (1994) concludes that artefacts are not substances because, unlike natural beings, they do not possess an inner principle of motion and rest. Shields (2008) argues that artefacts are not substances because, unlike living beings, they lack a self-directing and self-regulating principle (i.e. an inner principle that also is a soul). Living beings are teleonomical systems whose ends are not determined by convention. Artefacts, by contrast, are compared to mere heaps – which means that they do not possess a form at all. Most recently, Corkum (2023) has proposed a version of the binary view according to which artefacts are substances in the fullest sense but are not fundamental substances like living beings.[54]

Some supporters of the scalar view – according to which artefacts, while not *paradigmatic* substances, are nonetheless substances to a certain degree – appeal to similar reasons as Lewis. For instance, Gill (1989) and Irwin (1988), focusing on *Met.* Z 11, 1037a5 and similar passages in which Aristotle defines the soul as 'primary substance' (*prôtê ousia*), conclude that artefacts are not genuine substances because they do not possess psychological activity, or, more simply, a soul. This situation is not specific to artefacts, since lack of a soul is a condition that concerns inanimate beings in general. Another reason advanced by supporters of the scalar view concerns the relation between matter and form in artefacts. The unity of matter and form is accidental, and this would be the main ontological deficiency of artefacts in comparison to living beings. Furth (1988) and Koslicki (1997) are in favour of this position. Kosman (1987, 2013) seems to endorse the scalar view but does so on grounds that resemble those of Ross and Morel: artefacts are not paradigmatic substances because they are simply accidental compounds, just like horse-being-white. Artefacts are also accidental compounds on Cohen's (1996, 118) interpretation, which goes as far as to deny that artefacts have essences. It might be true that artefacts are accidental compounds or that they are not fundamental substances. However, what these readings fail to explain is why the

[53] Morel (2017, 193): 'Forms of artefacts are thus neither matter itself, nor substantial forms in the fullest sense. My hypothesis is that they correspond rather to an intermediary formal modality, between the properties of proximate matter and the form that is genuinely substantial.' (my translation).

[54] Artefacts are substances because they can ground nonsubstances as their qualities, but they are merely fundamental because they are themselves partly grounded in natural substances. Corkum (2023) aligns with a binary view of substantiality in that he understands the distinction between most-of-all substances and substances that are not most-of-all substances as 'the distinction between absolute and relative fundamental entities' (5).

characteristics in question merely make an artefact less of a substance, rather than not a substance at all. Moreover, none of these characteristics stand in direct contradiction with any stated criterion of substantiality.

The aim of this book is to provide a definitive answer to the question of why artefacts are metaphysically deficient when compared with Aristotle's favourite substances, such as animals and other living beings. Since I do not share Katayama's dismissive attitude towards the *Metaphysics*, I shall primarily refer to this work.[55] In fact, one of the main claims that I shall make is that we can extrapolate Aristotle's account of artefacts *from* the *Metaphysics*. This approach will be pursued without assuming from the outset that, on Aristotle's view, artefacts are not substances at all. I believe that it is worth asking in what sense artefacts could be ontologically inferior, without taking for granted that they are not *paradigmatic* substances or not substances *at all*. The only possible starting point is the undeniable fact that natural beings are still better candidates for substantiality in the *Metaphysics*. This does not, however, necessarily entail a scalar view of substantiality. When Aristotle speaks of substances 'most of all' (*malista*), *malista* might well refer to our understanding. For instance, Z 7 can be understood to mean either 'what we call substances-most-of-all' or 'what most of all we call substances'. Even though I shall ultimately argue that artefacts are not substances *at all*, there is much to be gained by not assuming this from the outset.

An assessment of Aristotle's ontology of artefacts is worth undertaking not only because scholars do not agree on the reasons for their non-substantiality or lesser-degree substantiality. There is another advantage in pursuing this study, as well: it is highly probable that an examination of the case of artefacts will provide insights into the nature of real substances. Outlining the reasons why artefacts are different from living or natural beings and understanding the reasons why they are not substances has several advantages. First, it will help us to understand whether primary substances are living beings or natural beings. Second, it will help us to finally grasp why living beings or natural beings are substances. Third, it will show whether Aristotle is committed to a binary or a scalar view of substantiality. Fourth, the attempt to define what artefacts are will help us to better understand what precisely makes something a natural thing. Aristotle's philosophy of technology thus might turn out to offer a new perspective on classic problems.

[55] Certain notions are presented in the *Physics*, but they can be proven to be accepted by Aristotle also in the *Metaphysics*.

0.4 A Piecemeal Approach

This book reconstructs Aristotle's account in a piecemeal fashion. In order to extrapolate Aristotle's ontology of artefacts, one needs to make use of passages from different works and of different passages from the same work. This is the case because Aristotle's perspective on artefacts depends, to varying degrees, on his critique of Plato[56] and on the general scope of the work at issue. The most relevant works for fully reconstructing Aristotle's metaphysical account of artefacts are the *Physics*, the *Generation of Animals* and, above all, the *Metaphysics*. Although an ontology of artefacts could be reconstructed within the *Metaphysics* alone, Aristotle takes over here some of the results achieved in the *Physics* and hints at notions that will be better qualified in *GA*.

In the *Physics*, Aristotle employs artefacts for both heuristic and pedagogical purposes. He makes use of the art analogy for heuristic purposes and introduces examples taken from the realm of artefacts for pedagogical purposes.[57] In the first case, Aristotle wants to draw conclusions that are valid for natural beings as well; in the second case, he wishes to clarify a notion or principle that is otherwise difficult to grasp. In the first case, Aristotle draws an inference that holds of natural beings based on the fact that it holds of artefacts too. In the second case, Aristotle merely clarifies or illustrates a principle or notion by means of a reference to artefacts, without that fact necessarily holding true of artefacts too – at least not in the same way or without further qualification. Whether the approach is heuristic or pedagogical, the *Physics* is concerned with the nature and behaviour of natural beings. It elaborates a theoretical framework that is the paradigm for more specialised studies of particular natural beings (e.g. elements or heavenly bodies). Hence, although the heuristic use of artefacts provides significant information about them, they are not the focus of the *Physics*' attention. After speaking about the principles at issue in the study of nature, Aristotle defines nature by excluding artefacts from the realm of natural things, as early as in the first chapter of the second book. Nature is an inner principle of motion and rest; for this reason, artefacts are not natural beings, since the principle of their motion and rest lies outside of them, for instance, in the artisan or the user. Although in the remainder of his work Aristotle makes widespread use of artefacts – both for heuristic

[56] I lay out the ways in which Aristotle's account of artefacts is in debt to Plato in Chapter 1.

[57] In this sense, I do not use the expression 'art analogy' as Sedley (2010) and Witt (2015a) use the expression 'craft analogy'. They refer it to both the heuristic analogy and the examples taken from the artificial realm.

and pedagogical purposes – natural philosophy is not concerned with them. Yet, this does not detract from the fact that what is said about them in the art analogy and the definition of nature is true. Most important, we learn that artefacts have intrinsic ends.[58] The theory of the four causes thus fully applies to them, such that no cause is left out. In order to draw a complete and fully justified picture of Aristotle's ontology of artefacts, it is therefore necessary to appeal to the *Physics* as well. Indeed, Aristotle's use of the art analogy, which is typical of the *Physics* and absent from the *Metaphysics,* provides crucial information about Aristotle's own stance on artefacts, the most important being that artefacts have intrinsic ends (i.e. proper functions). This feature is found also in the *Metaphysics* and plays a fundamental role in Aristotle's use of examples taken from the realm of artefacts, as well as in his concerns and clarifications about their status. Moreover, the second book provides a definition of nature that turns out to also include a definition of 'artefact' (i.e. a product lacking an inner principle governing its behaviour). The remainder of the *Physics* focuses on qualified comings-to-be, but the account in *Phys.* 1, as well as the definition of nature in 2.1, also cover unqualified coming-to-be (i.e. generation). This fact is important because Aristotle ascribes to artefacts proper unqualified coming-to-be. They are generated and undergo corruption just like natural beings.[59]

For this reason, *GA* too represents an important source for our understanding of unqualified coming-to-be. One might wonder why we would draw on biological works when enquiring about inanimate beings and question whether we are justified in using them, given that they are neither concerned with artefacts nor primarily focused on metaphysical issues. One part of the answer is that, in the *Metaphysics*, Aristotle hints at notions that will be better qualified in *GA*. Another part of the answer to this question takes us back to the *Physics*. Although Aristotle's definition of nature as an internal principle of motion and rest is wide enough to encompass both unqualified and qualified coming-to-be, the *Physics*, after excluding artefacts from its focus, mostly deals with qualified coming-to-be – while *GC* deals generally with coming-to-be and passing-away. The *Generation of Animals* is tasked with discussing the unqualified coming-to-be of living beings, in particular of animals. In doing so, *GA* not only borrows the theoretical framework of the *Physics*, but, like the *Metaphysics*, also accepts its conclusions concerning artefacts. The difference between art and nature as principles plays a significant role. Although artefacts are

[58] See Chapter 3 (Section 3.1). [59] I argue for this in Chapter 4 (Section 4.1).

similar to living beings in many respects, they lack a principle comparable to the heart in blooded animals or equivalent organs in other animals. Moreover, artefacts are used to mark similarities as well as irreducible differences. I shall draw on *GA* here not merely because Aristotle happens there to recall certain disanalogies between living and non-living beings, but, more importantly, because unqualified coming-to-be occurs in both the natural and the artificial realms, with significant consequences. Unqualified coming-to-be happens in such a way that it has repercussions on the metaphysical status and substantiality of the object.

In order to understand how this state of affairs translates into an ontology of artefacts we must appeal to the *Metaphysics*.[60] Here, Aristotle never employs the art analogy; that is, he never draws conclusions about natural beings on the basis of the claim that art imitates nature. The reason for this is simple: the *Metaphysics* does not concern the behaviour of natural things as such. While the heuristic use of artefacts is absent, the pedagogical use is still widespread. In general, the *Metaphysics* takes up the conclusions of the *Physics* concerning artefacts (i.e. that they possess intrinsic ends) and never questions it. That artefacts have intrinsic ends (i.e. functions) is treated as an established result. Whenever artefacts are used in the so-called negative sense, this never concerns the status of their forms as functions or their having a final cause.[61] Hence, the *Metaphysics* is filled with examples taken from the artificial realm, which aim particularly to clarify the status of matter and form, as well as that of actuality and potentiality. Such examples make sense precisely on the assumption that artefacts do, in fact, have forms that are functions or intrinsic ends. It is because the art analogy is still considered valid that artificial examples work – while still failing to be perfect examples, since things are more complicated in the case of living bodies. For instance, Aristotle is especially fond of using the example of a statue to illustrate the distinction between matter and form, as well as the distinction between actuality and potentiality. What holds true for natural substances is that they are composed of matter and form, but since matter and form are related in them in such a way as to be scarcely distinguishable, it is beneficial to illustrate hylomorphic structures by means of the example of a statue, as an artefact. What holds true of natural substances does not, however, necessarily hold true of artefacts *in the same way*: while a statue is

[60] The final chapter will reassess the relationship between the *Physics* and the *Metaphysics* in light of the results achieved.

[61] As we shall see in the final chapter, this is the case not only because the presence of intrinsic ends in artefacts is readily assumed, but also because the *Metaphysics* as such does not primarily concern itself with a functional analysis.

a compound of matter and form, the relation between its matter and form is different than in natural substances.[62]

Aristotle does not mention artefacts only for pedagogical purposes in the *Metaphysics*.[63] In other words, not only does he *use* artefacts, but he also defines some of their characteristics with no other purpose than defining them – in particular as opposed to natural substances. In several passages, Aristotle identifies a disanalogy between natural and artificial beings and we have no reason to doubt that he means what he says about artefacts. For instance, when Aristotle points out that objects made one by art constitute less of a unity than organisms, this can be taken at face value.[64] To be clear, he does not specify a certain difference in order to remind us that *Metaphysics* is not concerned with artificial beings but only with natural things, as he does in *Phys.* 2.1, when he specifies that artefacts have an external principle governing their behaviour. He does not need to clarify this point, because in the context of the *Metaphysics* it does not hold: metaphysics is not a natural science concerned with natural beings, but a science with a wider scope that is, to some extent, indifferent as to whether something is artificial or natural. Indeed, it is not surprising that Aristotle deals with, for instance, heavenly bodies and mathematical objects as well. This leads us to the topic of the unity of the *Metaphysics*, and to the question of how artefacts fit into it.

Despite the composite structure and history of Aristotle's *Metaphysics*, most scholars agree that it represents a unitary enquiry. However, scholars disagree about what makes the *Metaphysics* a single project. The readings that have been proposed are roughly the following: archaeological, theological, ontological and ousiological. On an archaeological reading, the *Metaphysics* is the enquiry into the first causes and principles, as announced in A 2.[65] On a theological reading, the *Metaphysics* as a whole is the study of

[62] I deal with this problem extensively in Chapter 6.

[63] *Metaphysics* Δ neither adopts the art analogy nor does it make use of artefacts as examples for pedagogical purposes. The aim of Δ is different and pedagogically oriented, in the sense that its purpose is to clarify the various ways in which a certain philosophical notion can be understood. Most notions include a way of being used that pertains to artefacts. For instance, one meaning of principle is the choice to make, one meaning of cause is the material and moving cause (i.e. the bronze and the art of sculpture), one meaning of nature is the matter in artefacts and so on. It is difficult to assess the metaphysical significance of the mentions of artefacts in Δ, but at least when he emphasises the difference between beings by art and beings by nature, we have no reason to doubt his sincerity (see Chapter 7).

[64] On this and similar passages, see Chapter 7.

[65] The first advocate of this reading was Alexander of Aphrodisias, who takes metaphysics to be an enquiry into principles and not to coincide with theology. Metaphysics is theology only insofar as one of the principles is the divine as final cause. For a modern account that is also compatible with an ontological reading, see Buddensiek 2018.

non-perceptible and eternal substances; its agenda is therefore announced in E 1 and culminates in Book Λ.[66] A third option is the ontological reading, which is based on the introduction of the study of the being qua being.[67] Another influential reading defines the science of the *Metaphysics* as ousiology (i.e. the enquiry into substance as addressed in Book Z). In the scholarship, there are also nuanced positions that attempt to harmonise a number of these readings.[68] The question of the unity of the *Metaphysics* is therefore open and complicated. However, one point accepted by all parties is that Plato and Platonic doctrines are a target. Moreover, an ontological reading appears to fare better when it comes to artefacts. If the *Metaphysics* is responding to the question 'what is being and what is it for something, anything, to be?',[69] then this effectively explains why it shows such an interest in artefacts.

There are two related philosophical reasons why artefacts belong in the *Metaphysics*. The first concerns the agreement that Plato is a target and, hence, its Platonic ancestry. The second concerns the ontological reading and thus the scope of the *Metaphysics*, in general, and of the middle books, in particular. The two reasons are deeply connected because addressing Plato – whether in the form of a direct *aporia* or a silent credit – is part of what it means to do ontology.[70] With regard to the first reason, artefacts appear frequently, albeit somewhat randomly, because Plato is a target. In these

[66] The theological reading is, for instance, defended by the Neoplatonic School of Alexandria. In Ammonius' view not only the *Met.* but the whole of the Aristotelian corpus is theologically oriented. For a discussion of the theological reading and its relation to ontology, see Menn (n.d., Ια1).

[67] For example, Kirwan 1993.

[68] Besides the developmental reading famously promoted by Jaeger (1912, 1923), there are interpretations that are in different ways both ontological and theological like those of Ackrill (1981), Natorp (1888), Owens (1951) and Merlan (1957). Owen (1960) proposes the focal meaning interpretation, which Frede applies to the *Metaphysics*: the being of the divine substance is the focal meaning 'in terms of which all other ways of being have to be explained' (Frede 1987, 87). The attention to Book Z also initiated so-called 'zetology', according to which the theory of substance as presented in Book Z is the theoretical centre of the *Metaphysics*. For an overview of the zetological approach, see Galluzzo (2006). The *Metaphysics* can also be viewed as a unitary enquiry into principles. Aristotle repeats that the enquiry is concerned with principles in the opening chapters of several different books (Γ 1, 1003a21–32, E 1, 1025b3–4, H 1, 1042a4–6). The archaeological reading might also apply to the central books on substance theory. The question of what a substance is can be reduced to the question of what the primary cause of 'its being the case that it is a substance' is (Code 1997, 359).

[69] Politis 2004, 260. His ontological reading incorporates the theological section of Λ 6–10 as ontological. More recently, Buddensiek (2018, 138) has argued that the objects of the 'science being sought for' are first causes and principles. However, he considers an ontological reading to be compatible with his archaeological interpretation: 'a science of being – as it may seem to be indicated in some *aporiae* – should not be a rival to a science depending on *archai*, but should be integrated within such a science' (139). This latter reading too seems able to explain why the *Metaphysics* shows an interest in artefacts.

[70] For example, Politis 2003.

contexts, Aristotle speaks specifically about artefacts, neither introducing the art analogy (which, as we have seen, is absent from the *Metaphysics*) nor using artefacts as illustrative examples. Aristotle does, however, use artefacts in three ways related to the Platonic ancestor. First, he uses artefacts as counter-examples or central elements of a counter-argument against the Platonic separation of forms.[71] Aristotle introduces artefacts in order to draw attention to an inconsistency in the Platonic conception of Ideas as objects of knowledge and as causes of movement (B 4 and K 2). Artefacts are introduced in order to refute the arguments from the sciences and the view that the eternity of movement must be referred back to the Ideas. Moreover, in *Met.* Z 7–9, Aristotle criticises Plato for separating out the Ideas, thus making them unable to cause the coming-into-being of substances. Artefacts are introduced to show that coming-into-being occurs even without positing corresponding Ideas and that the synonymy principle, according to which there is an efficient cause down here that has the same form as the product is sufficient to account for artificial production, as well as natural generation. Second, he avoids shortcomings of the Platonic theory by incorporating artefacts.[72] Third, he builds on sound Platonic intuitions by accommodating artefacts.[73]

With regard to the second reason, artefacts show up most prominently in the middle books of the *Metaphysics*. The reason why Aristotle is interested in artefacts in Z–H is that he is investigating per se being/being according to the *Categories*, which raises the question of what kind of being something is. In Z 1, the investigation of being is narrowed down to the analysis of substance. Hence, Aristotle investigates the causes and principles of substances, including hylomorphic substances. This is a broader enquiry than that of the *Physics* because it cannot simply be assumed that the only substances that exist are natural substances. Hence, one must also come to terms ontologically with artefacts, because they are beings and, therefore, fall within the scope of an analysis of being qua being. If metaphysics is, in fact, universal and, so to speak, explains every being, artefacts should be covered by it as well.[74] The extent to which artefacts *are* reflects the extent to which artefacts are *one* or constitute

[71] See Chapter 2. [72] See Chapter 1 (Section 1.2) and Chapter 3. [73] See Chapter 1 (Section 1.3).

[74] Now, part of the problem with the latter is that one might argue that there is no science of artefacts, so perhaps they do not fall within the scope of metaphysics after all. This position has been recently defended by Bolton (2018), who argues that artefacts are conventional items and that there is no science of them because they do not have a *phusis* that is specifiable into kinds. I shall challenge Bolton's view in different ways: artefacts can be shown to have a form that is specifiable in terms of function and, thus, there exist artefact-kinds, which metaphysics, as well as natural philosophy, can target.

a unity. At this point, a clarification about the relation between being and being one in general is perhaps necessary. From a certain point of view, the two notions do not coincide. In fact, the question of what is most fully one and the question of what is most fully being lead to different answers. What is most fully one is what is most indivisible, and what is most indivisible is the numerical one. By contrast, what is most fully being is what is most fully separate and determinate, which is substance. It thus seems that we obtain two different answers that cannot be said to coincide: the numerical one is not a substance. There is no such substance as the numerical one. Nevertheless, Aristotle suggests a way in which being and one are the same, and this is the point of view from which the two notions coincide. In *Met.* Γ 2, 1003b26–33, we are told that 'being and one are the same and are one thing in the sense that they are implied in one another as principle and cause are', that there are as many species of being as of unity and that 'unity is nothing apart from being'. In *Met.* I 2, 1054a13–19, Aristotle addresses the same issue: the meanings of 'one' correspond to the categories of being, and the one is not comprised within any category. Rather, in each category there is a correspondence between what a thing is and its way of being one. In the category of substance, which we are dealing with, some beings are unitary and simple, but their very nature does not coincide with being one. To spell this out: the being of a house is not to be one, but when I search for the cause of being of a house, I end up with something (the substance as actuality) that is also that through which a plurality of parts constitutes a unity. What a house is corresponds to its way of constituting a unity. In Z 16, the reason why elements are not substances turns out be their lack of unity. Artefacts, by contrast, appear to be unities in the requisite sense and hence an investigation of them is needed. Book H then examines how perceptible substances (i.e. substances that have matter, exist and are one): 'These are the sensible substances, and sensible substances all have matter' (H 1, 1042a25). Because artefacts are perceptible substances, they enter into the framework of the analysis carried out in H. This book will highlight the differences between the cases of natural substances and artefacts. While H 2 claims that the actualities of artefacts are only analogous to the actualities of natural substances, H 4 stresses the differences between natural and artificial matter. The analysis is then clearly transposed into the schema of actuality and potentiality in Book Θ.

To be clear, there are two questions that the *Metaphysics* inherits from the *Categories*. The first is what kind of being something is; the second is whether something is a substance. Now, with regard to the first question, Aristotle needs to incorporate artefacts into his ontology because they are *one*, to some

extent, and therefore, to this same extent, they *are*. With regard to the second, more specific question, in Z 13 Aristotle provides a criterion of substantiality that does, in fact, have to do with unity. A thing is a substance if it is not composed of constituents present in it in actuality; for if they were present in it in actuality, the thing would not be one but many. In Z 16, we learn that the elements and parts of living beings fail to meet precisely this criterion of substantiality: although there is a sense in which they *are*, they fail to be substances to the extent that they are not a unity. By contrast, because artefacts are a unity, at a least to some extent, the following analysis must take them into account – as H and Θ do. This analysis, however, also highlights the differences between artefacts and living beings, especially in terms of the status of their forms and the unity between matter and form. In order to explain this state of affairs, Aristotle must call to mind coming-to-be; that is, the way in which things have come to acquire the forms that they have and to exhibit the relation between matter and form that they display. For this reason, both H and Θ engage in a discussion of artificial and natural coming-to-be, expanding on the account proposed in Z 7–9.

Now, that there is an extent to which artefacts are a unity is not obvious. This is suggested, however, by the presence of artefacts in the middle books of the *Metaphysics*, since this presence is not due to their use as examples or analogical cases, but to a specific interest in them. Aristotle's engagement with artefacts here appears to be prompted by specific philosophical reasons concerning the relationship between being and being one. Still, in the absence of further evidence, one might find this to be an unsatisfactory explanation of why artefacts are said to constitute a unity to some extent. Here, Book Δ comes in handy. In particular, chapter 4 on the notion of nature, chapter 6 on the notion of oneness, chapter 26 on the notion of whole and chapter 27 on the notion of mutilation provide important confirmation that there is an extent to which artefacts are a unity. These chapters provide a negative and therefore highly informative treatment of artefacts. They reinforce several of our intuitions concerning artefacts, the first one being that there are also strong philosophical reasons for including artefacts in the *Metaphysics*.

0.5 Aristotle's Ontology of Artefacts

Aristotle's Ontology of Artefacts defends three main claims. The first is that Aristotle provides a coherent and detailed ontology of artefacts. This claim conflicts with the common view that Aristotle merely uses artefacts as

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examples or analogical cases but is ultimately interested in shedding light on other things that are worthier of explanation. The second claim is that this account is, in several ways, in debt to Plato. As the third claim, the book does not challenge the widely shared view that for Aristotle substances are, in the first instance, living beings. It does, however, defend two controversial positions, both of which are of central importance for determining the place of artefacts in Aristotelian metaphysics, and indeed for his metaphysics as a whole. The first is that Aristotle holds a binary view of substantiality according to which artefacts are not substances *at all*. The second is that artefacts fail to be substances because they exhibit *less* of a unity than natural wholes. My position therefore consists in a binary view of substantiality and a scalar view of unity. I shall elaborate this interpretation through a reconstruction of Aristotle's ontology of artefacts that is divided into eight chapters:

Chapter 1 – 'The Platonic Heritage' – illustrates what Aristotle has inherited from his Platonic background and shows the motivations behind Aristotle's own interest in artefacts. I first present Plato's metaphysics of artefacts by examining mentions of Ideas of artefacts in the *Cratylus* and the *Republic*, as well as doubts about the range of forms voiced by young Socrates in the *Parmenides*. I also consider the *Timaeus* and its description of the cosmos as the product of art. I then divide Aristotle's reactions to Plato into three kinds. First, as Chapter 2 will show, Aristotle uses artefacts against Plato, either as counter-examples or as central components of a counter-argument against the Platonic theory of forms. Second, mindful of the fact that artefacts represent potential threats if they are not accommodated, Aristotle incorporates them while reacting to Plato's shortcomings. Third, Aristotle identifies and builds on Plato's correct metaphysical intuitions.

Chapter 2 – 'Using Artefacts against Plato' – is devoted to presenting Aristotle's use of artefacts as counter-examples or crucial elements of counter-arguments against the Platonic theory of forms, especially Platonic separation. Far from presenting arguments against the substantiality of artefacts, the passages in which Aristotle states that no one would posit a separate form for artefacts are tailored specifically to Plato. In particular, artefacts are used to point at the internal incoherence of the Platonic theory of Ideas and its incompatibility with sensible experience as well as to refute the Platonic version of the arguments from the sciences and the semantic/logical argument.

In Chapter 3 – 'Aristotle's Building Blocks in the *Physics*' – the focus is on the deficiencies of Plato's theory as a source of an account that

incorporates and further discusses artefacts. It sets out Aristotle's complaints about Plato's failure to recognise final causes and his notion of imitation as a means of accounting for the relationship between universals and particulars. I therefore present Aristotle's theory of the four causes and art analogy as a response to both criticisms. Moreover, the description of particulars as created by the Demiurge through the imitation of the Ideas seems to turn all particulars – whether natural or artificial – into artefacts. Aristotle's distinction between 'artificially caused' and 'artefact' is presented as a device that responds to the story told in the *Timaeus* and, at the same time, provides us not only with the salient feature of artefacts but also with an inventory of artificial things from Aristotle's perspective.

In Chapters 4–7, I present the main body of Aristotle's ontology of artefacts. The content of each chapter explores Aristotle's use of Platonic metaphysical intuitions as the source of his account of artefacts. At the same time, each chapter challenges one or more interpretations advanced by modern scholars about the ontological status of artefacts in Aristotle.

Chapter 4 – 'Artefacts as Hylomorphic Compounds' – argues that artefacts are hylomorphic compounds. The view that artefacts possess inherent substantial forms is controversial, since in the scholarship it is often argued that artefacts are either mere matter or matter arranged in a certain way (i.e. either heaps or accidental beings). For this reason, I provide three arguments in defence of the hylomorphism of artefacts: (i) they undergo unqualified coming-to-be as opposed to qualified coming-to-be; (ii) they comply to the '*ekeininon*' rule, according to which the identity of an object cannot be reduced to its matter; (iii) they conform to the synonymy principle insofar as the form in the mind of the artisan is the form in the object being thought. Once the presence of a form in artefacts has been established, the next step is to grasp the nature of this form and the extent to which it differs from the form of a living being.

Chapter 5 – 'Forms of Artefacts as Inert and Intermittent' – identifies the form in the mind of the artisan as the only form with efficient powers. By means of the rejection of the transmission theory – according to which the form in the mind of the artisan is transmitted to the object during the process of production – I argue that the inherent forms of artefacts lack efficient powers (i.e. they are not principles of motion and change), although this is still not the reason why they are not substances. Moreover, even if the inability of forms of artefacts to reproduce means that artefacts are not eternal, the non-eternity of artefacts and of their forms does not contradict any substantiality-criterion, as some claim.

In Chapter 6 – 'The Relation between Form and Matter in Artefacts' – I argue that forms of artefacts are functions and that they enjoy a many-to-many relationship with the diachronic matter, as well as a contingent relation with the synchronic matter. Although the focus on the unity between matter and form is the right approach to the solution of the substantiality issue, it does not yet provide us with the *immediate* reason for which artefacts are not substances.

This immediate reason is arrived at only by means of the consideration of matter as parts and the focus on the relation of parts and whole, which is undertaken in Chapter 7 – 'The Relation between Parts and Whole in Artefacts'. Indeed, artefacts fail to satisfy the substantiality criterion, according to which no substance is composed of parts present in it in actuality. I show that Aristotle regards living beings as constituted of parts in potentiality, while he conceives of artefacts as constituted of parts present in actuality. Because their parts are in actuality, artefacts are not as unified as substances, but because artefacts still possess an inherent form, they cannot be downgraded to mere heaps. Thus, artefacts are hylomorphic compounds, but not substances *at all*.

Finally, after shifting the focus from the maker to the user, Chapter 8 – 'The Physics and the Metaphysics of Artefacts' – reconsiders the previous two chapters as respectively representing the perspective of the natural philosopher, the maker, and the user and that of the metaphysician on artefacts. It discusses the relationship between the *Physics* and the *Metaphysics* and redefines their respective role in and specific contribution to our reconstruction of Aristotle's ontology of artefacts.

In the conclusion, I revisit the discussions in modern metaphysics and situate Aristotle's model within the landscape of theoretical options. Furthermore, I identify those pillars of Aristotle's ontology of artefacts that can serve as guidelines for the modern debate.