

RESEARCH

"Nothing in Nature Is Naturally a Statue": William of Ockham on Artifacts

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Among medieval Aristotelians, William of Ockham defends a minimalist account of artifacts, assigning to statues and houses and beds a unity that is merely spatial or locational rather than metaphysical. Thus, in contrast to his predecessors, Thomas Aquinas and Duns Scotus, he denies that artifacts become such by means of an adventing 'artificial form' or 'form of the whole' or any change that might tempt us to say that we are dealing with a new thing (*res*). Rather, he understands artifacts as *per accidens* composites of parts that differ, but not so much that only divine power could unite them, as in the matter and form of a proper substance. For Ockham, artifacts are essentially rearrangements, via human agency, of already existing things, like the clay shaped by a sculptor into a statue or the stick and bristles and string one might fashion into a broom. Ockham does not think that a new thing is thereby created, although his emphasis on the contribution of human artisans seems to leave questions about the ontological status of their agency open. In any case, there are no such things as natural statues, any more than there could be substances created by human artifice.

Keywords: artifact; substance; parsimony; *per se* unity; *per accidens* composite; human agency

Every summer when I was a boy, my mother and father would pack us into the car at our home in Ontario and we would make a long journey west, to Saskatchewan, to visit my grandparents and enjoy several weeks under the endless prairie skies. Needless to say, the journey there and back also seemed endless, especially to us kids. So my parents enlivened the trip with sightseeing along the way. One of their favorites was the famous 'Sleeping Giant' in Thunder Bay, Ontario: basically a rock formation along the southern tip of the Sibley Peninsula which, when seen from the city to the West, looks like a human figure lying on its back; indeed, it was so identified in Ojibway legend, well before Europeans arrived in the area.

I remember looking forward to seeing the Sleeping Giant for the first time with great anticipation, imagining it as some giant statue of a man. But it was difficult to contain my disappointment when I finally saw it. The view was spectacular, to be sure, but it didn't look to me at all like a giant, sleeping or otherwise. I kept thinking that I wasn't looking at it the right way, but no matter how hard I squinted, it still looked to me like a rocky peninsula jutting out into Lake Superior, which is what it was (my mother finally 'decoded' the giant's parts for me after I sheepishly admitted I couldn't see it).

As it turned out, as a graduate student reading medieval texts on natural philosophy some years later, I discovered I was not alone. William of Ockham (c. 1285–1347) would have been a sleeping giant-denier too, for he bluntly asserts that there are no such things: "nothing in nature is naturally a statue [*nulla res naturalis est naturaliter statua*]."¹ In this, he follows most medieval readers of Aristotle's *Physics*, who knew that the Philosopher distinguishes sharply between natural things and artificial things, or things that lack

¹ William of Ockham, *Summula Philosophiae Naturalis* I, cap. 20 (in William of Ockham 1984: p. 211, ll. 63–64); hereafter '*Summula*', by book and chapter of the text, plus page and line numbers of the edition (*OP* = *Opera Philosophica*). All translations are my own. We do not know when this treatise was composed, but presumably it dates from Ockham's teaching career at Oxford or the Franciscan custodial school in London.

any "innate impulse to change."² For medieval Aristotelians,³ natural things such as trees and dogs and humans are paradigmatic substances, each having a real essence and constituting something one *per se*, whereas artifacts such as brooms and beds and houses have only a *per accidens* unity, meaning that their formal structure has been imposed upon them by an external agent, the artisan, who reconfigures natural 'raw' materials into something that serves her own contingent purposes. Artifacts are not substances because substances, or 'natures', stem from God's will in creating the universe; human artisans lack the power to create any new natures, although they can imitate nature, as Aristotle says (*Phys.* II.2, 194a21). Accordingly, artifacts must have a different, which is to say lesser and derivative, ontological status.

Despite their agreement that artifacts are not substances, however, medieval Aristotelians argued a lot about how artifacts are constituted metaphysically. Might we speak of an artifact as acquiring its unity from an accidental or 'artificial' form, even though it lacks a proper essence? If so, an artifact might be said to have multiple forms, in keeping with its several stages of production or perhaps multiple purposes. Thus, Thomas Aquinas (1225–74), commenting on Aristotle's famous axe example from *De anima* II.1 (412b15) – "as it is, it is an axe" – speaks about artifacts as having accidental, "artificial forms," as opposed to the natural forms they would have if they were substances belonging to the created order.⁴ But William of Ockham rejects this, taking the more the more parsimonious line that artifacts are not new things but merely contingent collections or arrangements of things of old things, i.e., natural things which already exist, and furthermore that the *per accidens* unity exhibited by artifacts is merely spatial or locational and so not even worthy of the name 'form'. There are no artificial forms on Ockham's view.

In what follows, I will provide a brief reading of one text in which Ockham defends this minimalist account of artifacts, exploring some of the theoretical motivations behind it.⁵ I will then consider whether it is really as ontologically low-impact as Ockham seems to think, given his well-known commitment to avoid multiplying entities beyond necessity.⁶

Artifacts in the *Summula Philosophiae Naturalis*

Ockham deals with the question of artifacts in Chapter 20 of his *Summula Philosophiae Naturalis*, or "*Compendium of Natural Philosophy*."⁷ In the Prologue, he describes the work as offering a comprehensive treatment of natural philosophy according to Aristotelian principles, explicitly committing himself to treating natural science "on the basis of Aristotle's views [*secundum intentionem Aristotelis*]" rather than the truths of the Catholic faith.⁸ This comment is unremarkable among fourteenth-century authors. Aristotle's *Physics* was a required text for the bachelor's degree at medieval universities, and, much like today, the undergraduate curriculum was focused on providing students with the literary and scientific training they would need to go on to study in one of the graduate faculties: Law or Medicine or Theology. Far from radically endorsing pagan science for all, Ockham is simply indicating here that he has written the treatise primarily for those who are studying natural philosophy for the first time. But Ockham's *Summula*

² Aristotle, *Physics* II.1, 192b18; tr. Hardie and Gaye in Aristotle 1984: vol. 1, p. 329.

³ It should be noted that other than a handful of logical works translated by Boethius, the full Aristotelian corpus was not available in Latin until the latter half of the 12th century, after which it took another 50 years or so for Aristotle's works to become part of the Arts curriculum at medieval universities and fully understood. The 'medieval Aristotelians' I refer to here were active between the second quarter of the 13th century and the mid-14th century.

⁴ Thomas Aquinas, *Sententia libri De anima* II, lect. 2, n.3: "And because substantial forms, of which sort are the forms of natural bodies, are hidden, <Aristotle> clarifies this <question of the soul's nature> through artificial forms, which are accidental [*Et quia formae substantiales, cuiusmodi sunt formae corporum naturalium, sunt latentes, manifestat hoc per formas artificiales, quae sunt accidentales*]." The term "artificial form [*forma artificiale*]" is not to be found here or elsewhere in William of Moerbeke's Latin translation of Aristotle's *De anima*, which Thomas was using. For discussion of Thomas' rather complicated views on artifacts, see Rota 2004.

⁵ The usual medieval locus for questions about artifacts was the large and metaphysically sophisticated genre of mereology, or part/whole composition, to which Arlig 2015 offers a superlative introduction. For Ockham's theory of composition more generally, see Cross 1999 and Normore 2006.

⁶ We actually find the razor explicitly cited in this connection in another work of natural philosophy, the *Brevis Summa Libri Physicorum*: "in the generation of artificial things, no new thing is produced that is really distinct from a natural thing; but due to local motion, there is a new designation, which is called 'generation', broadly speaking. And the reason for this is that a plurality of things should not be posited unless it is necessary to do so [*in generatio artificialium non est productio alicuius novae rei distinctae realiter a re naturali; sed propter motum localem est ibi nova denominatio quae vocatur generatio, largissime loquendo. Et huius causa est quia plura non debent poni sine necessitate*]" (*Brevis Summa* II, cap. 1 (*Opera Philosophica* VI, p. 25, ll. 21–25)).

⁷ Of course, Ockham treats of artifacts in other places, basically whenever he has occasion to comment on the opening chapters of *Physics* II: *Brevis Summa libri Physicorum* II; *Expositio Physicorum* II; *Quaestiones in libros Physicorum Aristotelis*, qq. 118–121. I focus here on the *Summula* because it offers a particularly clear rendition of his teaching on artifacts.

⁸ *Summula*, proemium (*OP* VI, p. 137, ll. 11–12).

Philosophiae Naturalis is not exactly an introductory text on Aristotle's *Physics* either. In it, we see Ockham engaging in the kind of innovative reading that was common in medieval lecture halls, where authoritative texts were sometimes interpreted in ways that appear contrary to their authoritative author's intention, even openly so, where Aristotle is 'corrected' or 'improved'.⁹ So sometimes in medieval philosophy original work gets done where you least expect it: in purportedly elementary textbooks written for undergraduate students and teachers trying to understand a difficult required text.

Chapter 20 of the *Summula* is addressed to the question of artificial forms, specifically whether "the form of an artificial thing [*forma rei artificialis*]" is, taken as a whole, really distinct from each natural thing. Ockham makes clear that he is thinking of artificial forms here as accidental forms distinct from their matter, coming to the matter through art, or the activity of the artisan.¹⁰ The Latin term '*res*' or 'thing' carried ontological weight for medieval philosophers in the sense that it demanded an account: what kind of thing are we talking about? A *res* is something that really exists (no surprise there: the term is the root of our English term 'reify'). Furthermore, in medieval philosophical texts, '*in rebus*' or literally, 'in things', can often be translated as simply 'in reality', and '*in rebus naturalibus*', as 'in the natural order'. The fact that '*res*' carries the connotation of extramental existence is surely one reason Ockham was interested in saying something about artificial *res* in Chapter 20.¹¹

To understand Ockham's position on artifacts in Chapter 20, however, we need to look at the previous question, which seeks to establish that the essence of a composite substance, which is a *per se* whole, does not differ from its essential parts, i.e., its matter and substantial forms. Ockham's implicit target here is his Franciscan predecessor, John Duns Scotus (c. 1265–1308), who argued that composite entities require not only matter and form but an additional form, "the form of the whole [*forma totius*]," to account for their composition.¹² Ockham disagrees with Scotus in nearly all matters ontological (though always gently), and this is no exception.

The stage is further set for the discussion in Chapters 19–20 at the very beginning of the *Summula*, where Ockham divides things that exist into two kinds, simple and composite. Simples are divided into things that lack any partwise composition, i.e., abstract or immaterial intellectual substances (e.g., angels), though Ockham also includes here "thoughts and accidents of the intellective soul [*intellectiones et omnia accidentia animae intellectivae*]" if, as seems to be Aristotle's view, the intellective soul is indivisible. Other simples have parts, but those parts are all of the same kind. Here Ockham mentions celestial bodies as well as "corporeal accidents, prime matter, and every form [*accidentia corporalia et materia prima et forma quaelibet*]."¹³ The key notion here is the absence of metaphysical composition: even if the simples in question can be physically divided in some way, they are still simples from a metaphysical point of view.¹⁴

Now composite things, according to Ockham, are composite either *per accidens* or *per se*. The latter are said to be composites forming "one thing *per se* [*per se unum*]" such as fire, air, stone, plants, animals, and humans (these are his examples). These are bona fide substances, composed of matter and form, but what strikes Ockham about them is not the 'tightness' of their composition but the diversity of their elements: "each of these," he says, "is composed of matter and form, which are not of the same character but are more distinct in their natures than a human and a donkey."¹⁵ Substances have natural forms, but natural forms

⁹ Such conflicts were inevitable when the mix of authorities included Aristotelian philosophy, sacred scripture, and Christian doctrine. Solutions ranged from the ingenious to the devious, e.g., from Thomas Aquinas' use of the notion of incomplete substance to augment Aristotelian psychology with a theory of personal immortality, to Ambrose of Milan's erasure of familial and personal *exempla* from the moral teachings of pagan works such as Cicero's *De officiis*, and their replacement with biblical ones more suited to his Christian audience.

¹⁰ *Summula* I, cap. 20 (OP VI, pp. 208–209).

¹¹ There is no doubt that artifacts are things. For Ockham, the '*res*' question more precisely concerns whether artifacts (and whatever is required to make them so) exist outside the mind *in addition* to the other really distinct things he takes to exist, i.e., substances, their essential parts, and (some of) their qualities.

¹² I must limit myself here to treating Scotus's views following Ockham in the *Summula*, which is to say, as a foil for his own account. For discussion of Scotus's influential account of material composition, see Cross 1995 as well as the excellent study by Ward (2014). As Cross notes, "Scotus claims that a whole composite substance is some absolute entity really distinct from all its parts," which entity (the '*forma totius*' – the term is the same in Scotus and Ockham), is not itself part of some further whole (1995: 156).

¹³ *Summula* I, praeambula (OP VI, p. 154, ll. 425–31). Ockham is presumably referring here to compounds whose parts are entirely uniform, or homoeomerous, like water or plain vanilla ice cream. See Aristotle, *On Generation and Corruption* I.10, 328a10–12.

¹⁴ By 'metaphysical' composition here I mean hyloplomorphic or substantial composition, as opposed to merely material or integral composition. On the medieval understanding, integral wholes are those whose parts are producible by physical division.

¹⁵ *Summula* I, praeambula (OP VI, p. 154, ll. 440–43; cf. *Scriptum in Librum Primum Sententiarum (Ordinatio)* IV, q. 24, d.1 in *Opera Theologica* IV, pp. 76–77): "quorum quodlibet est compositum ex materia et forma quae non sunt eiusdem rationis sed plus distinguuntur secundum suas naturas quam homo et asinus."

differ so much from their underlying matter that they can be imparted only by God (or other substances, by divine instrumentality). Of *per se* composites, some are animate, such as plants and animals; others are inanimate, such as air and stones. Animate *per se* composites divide into those which are animated by means of a sensory soul or vegetative soul; sensory *per se* animate composites are further divided by whether or not they also possess a rational soul.¹⁶

But it is the other kind of composite that interests us here. Ockham describes *per accidens* composites as "artificial things ... such as a house, a bed, and such like [*artificialia, sicut domus, lectus et huiusmodi*]." ¹⁷ He does not elaborate on their nature in the introduction to the *Summula*, but we can infer what the difference must be: artifacts have parts that differ, but not so much as matter and form. Whatever composition they have, it is not the composition of matter and form because that would make them into substances, or composites forming something one *per se*. The accidental unity of artifacts assumes that the difference between their parts is not so great as to be unbridgeable by human agency.

Are there other conditions that figure in the definition of an artifact? This is the question to which Ockham returns in Chapter 20. But, as we have seen, his answer is adumbrated in the previous chapter, where he criticizes the Scotistic notion that some advening 'form of the whole' is necessary to explain the composition of matter and form. At issue here is the question of whether matter and form suffice as principles of generation in natural philosophy. Ockham quickly disposes of the Scotistic view with his razor, arguing that advening forms would lead to either infinite regress or explanatory redundancy: regress in case the resulting composite constitutes a fourth entity (in addition to the matter, the form, and the advening 'form of the whole'), since that further composite wants explanation; redundancy if the three entities do not make a fourth entity, in which case, why do we need a third entity in addition to just the matter and the form?¹⁸ These are standard tropes of argumentation for razor-wielding nominalists.

But then, Ockham notes that:

... it is different as regards artifacts, because one part can remain distinct from another such that the parts can exist simultaneously¹⁹ in the natural order even though they are not united; thus, that whole is not always and by necessity those parts that exist, but it is those existing parts only when the parts are united in the right way, and properly and spatially situated. But when they are separated or not spatially arranged in the right way, then the whole – a house, say – is not those parts. And since it is possible that those remaining parts are sometimes properly arranged and situated and sometimes divided from each other, 'the house is its parts' is therefore sometimes true and sometimes false; nevertheless, whenever those parts are arranged in place in the right way, then the house is those parts.²⁰

Ockham seems to be saying that artifacts differ from matter/form composites in that their unity is spatial or locational rather than metaphysical. But more than having parts that are "properly and spatially situated [*localiter situatae et convenienter*]," artifacts must be put together "in the right way [*debito modo*]." What is the 'right way' and whence does an artifact acquire this order?

Before answering this question in Chapter 20, Ockham further clarifies his view by responding to some objections. First, if a house is destroyed, wouldn't we say that some entity [*entitas*] is lost? Ockham replies that what is lost is not any entity or thing [*res*], but only the unity or spatial proximity of its parts. Clearly, the

¹⁶ Interestingly enough, despite his commitment to parsimony, Ockham thought the evidence required him to conclude that the human sensory and intellectual souls are distinct. See *Quaestiones in librum secundum Sententiarum (Reportatio)* II, q. 20 in *Opera Theologica* V, pp. 425–47.

¹⁷ *Summula* I, praeambula (OPVI, p. 154, ll. 438–39). Of course, the individual components of a *per accidens* composite may have *per se* unity insofar as they are natural substances: bits of wood, metal, stone, &c.

¹⁸ *Summula* I, cap. 19 (OPVI, pp. 205–206).

¹⁹ The Latin term '*simul*' is ambiguous between spatial and temporal senses, i.e., between co-location (or sometimes, two things being immediately adjacent) and simultaneity. Ockham means it in the latter sense here.

²⁰ *Summula* I, cap. 19 (OPVI, pp. 206–207): "... de artificialibus est aliud, quia una pars potest manere distincta ab alia, ita quod partes potest simul esse in rerum natura quamvis non sint unitae, ideo illud totum non semper et necessario est illae partes existentes, sed tunc solum est illae partes existentes quando partes sunt debito modo unitae et localiter situatae et convenienter. Quando autem sunt separatae vel inconvenienter ordinatae secundum locum, tunc totum, puta domus, non est illae partes; et quia hoc est possibile quod illae partes manentes sint quandoque debite ordinatae et situatae et quandoque a se diversae, ideo haec est vera quandoque 'domus est illae partes' et quandoque est falsa; tamen quodcumque illae partes sunt debito modo ordinatae secundum locum, tunc domus est illae partes."

wood and stones can and frequently do go on to constitute other things. Ockham says that when we destroy an artifact like a house, the proposition 'the house exists' becomes false, and we predicate destruction of the house in the third of the three ways in which something can be corrupted – ways he sketched in Chapter 16 of the treatise.²¹ The first two of these involve the palpable loss of some entity or thing, whether we are speaking of one of the parts of a composite or the absolute coming to be or ceasing to be of a non-composite entity. The third and broadest sense, however, is the one that applies to artifacts. In this sense, we simply predicate non-existence of a name that used to supposit or stand for something actually existing, but which no longer does, regardless of whether its parts continue to exist or not. In other words, there may be no loss of any entity or thing when something is corrupted in the third sense, but, as in the case of the destroyed house, only a change in the location of its parts, all of which continue to exist elsewhere!

From the perspective of medieval natural philosophy, this suggests a view of artifacts as ontologically neutral. Artifacts are not new things but old or already existing things arranged in new ways. Thus, I could tie an already existing stick to some already existing bristles using some already existing string and thereby make the following proposition true: 'a broom exists'. But nothing, i.e., no thing, comes into being thereby, the key Latin word here being '*de novo*' or 'anew'. Artifacts begin and cease to be, but unlike substances, nothing is gained or lost in the process. Only the 'where' of their already existing parts has changed.

The second objection asks what the matter and form could be said to cause other than the composite entity since they cannot be causes of themselves. Ockham replies that for matter and form to be parts of the composite is just what it means to say that they are its causes, i.e., causes of the entire composite. This is a very weak sense of 'cause'. Ockham elaborates by suggesting that we should think of the causal contribution of matter and form to the composite in the same way individual human beings belong to a people: they contribute to the composite materially, but the loss of any one part by itself does not entail the loss of the composite.²² This reply seems to miss the point that unlike people, matter/form composites are not integral but metaphysical wholes. But Ockham may only be saying here that in the strict sense, the integral parts of any entity have no greater causal power than that, so that if you insist on treating matter and form as integral parts, that is all the causal power they have too. Of course, we are free to speak of the 'matter' and 'form' of artifacts in an extended sense, but when we do so we are equivocating, not unlike the way medieval logicians commonly refer to the subject and predicate terms as the 'matter' of a proposition and the copula verb as its 'form'.

According to the third and final objection, the mere co-location of matter and form does not produce a composite; you must have something else, viz., 'the form of the whole', to unite them metaphysically. Ockham replies by simply denying that matter and form could be co-located without the one informing the other, at least on Aristotle's account. So co-location suffices for metaphysical union in the natural order. Now Ockham is elsewhere committed by the doctrine of the Eucharist to holding that *per impossibile – per impossibile cursu communis naturalis*, that is – if the matter and form of a substance were separated, you would no longer have a single composite that is one *per se* (or you would have another thing entirely, as when the substance of the bread is miraculously annihilated in the Eucharist and the remaining accidents attach to the quantity of the bread as a quasi-subject, which then participates *indistanter* or immediately in the risen body of Christ).²³ But Ockham acknowledges that there are different kinds of wholes, whose parts exhibit different kinds of union: in addition to wholes whose parts are co-located (including substances as well as certain *per accidens* composites like hot water and tea), there are also wholes whose parts are immediately adjacent to each other (e.g., continuous magnitudes like tables, and perhaps certain *per accidens* composites like the Corona and the lime, or the Margarita and the salt); as well as more disparate wholes like populations, which still exhibit a 'right order'.²⁴ Ockham does not say how closely ordered the parts must be to count as wholes in this last sense, but presumably one could be an Edmontonian not only spatially, in virtue of living with other people in and around 55.5 degrees north latitude and 113.5 degrees longitude west of the Prime Meridian, but also genealogically, by virtue of having been born and raised there.

With the reifying danger posed by Scotus's advening form of the whole at bay, Ockham finally turns in Chapter 20 to the question of whether artifacts, or artificial things, have forms, and if so, in what sense. His position, which he says is "in keeping with Aristotle's way [*secundum viam Aristotelis*]," is that "when an artifact is produced, no new thing is generated in its entirety anew [*nulla res nova secundum se totam generatur*

²¹ *Summula* 1, cap. 16 (*OPVI*, pp. 197–98).

²² *Summula* 1, cap. 19 (*OPVI*, p. 207, ll. 64–76).

²³ For discussion of Ockham on the Eucharist, see Chapter 9 of Adams 2010.

²⁴ *Summula* 1, cap. 19 (*OPVI*, pp. 207–208).

de novo].²⁵ So a broom or a statue or a mug of tea is not a "new thing [*nulla res nova*]," nor is it brought into existence "from scratch [*de novo*]," in the way that God (or Nature, writ large, as the expression of God's will) makes substances. It is not necessary to speak of such artifacts as being what they are by virtue of an adventing artificial form, introduced by the mind and industry of the artisan. The change in question is much more minimal. Late scholastics such as Suárez and the Conimbricenses spoke here of changes in the *ubicationes* or 'where-ings' of substances, a description that would have met with Ockham's approval.²⁶

Not all artifacts are produced by rearrangement, however. Here Ockham mentions artisans who work with mediating natural causes to produce new things in agriculture; thus, a new breed of plant or animal would on his account be a new thing with a new substantial or accidental form. The novelty here is not primarily attributable to human agency, however, but rather to the "mediating natural causes," which the artisan simply manipulates.²⁷ So a new breed of plant or animal would, like a broom or a statue, result from the artisan's strategic rearrangement of natural causes, bringing things with the right natural dispositions into proximity with each other so that those dispositions act to produce a new thing.

Ockham's resistance to speaking of artifacts having their own artificial forms is due to his finding it inconceivable how such a form could be equally present to all of its material parts, which would be necessary if it were to constitute a proper or *per se* unity. He argues for this by ruling out the alternatives. For if some new form were generated, he says, how would it be present to the parts that are already there? It would have to be either definitively present to its parts (=whole in whole and whole in part), or circumscriptively present (=whole in whole and part in part), or else located in some part of the artifact. But it couldn't be definitively present, since that is the mode of presence proper to indivisibles, which on Ockham's view do not exist outside the mind. Nor could it be circumscriptively present, since no new substantial or accidental form is added to the wood or stones when a house is built – the building materials are still the same and not intrinsically altered in any way; the bricks merely move from a pile in the brickyard to the north wall of the house. Ockham does not discuss the third alternative, presumably because the same arguments would apply against part of the artifact being newly informed as against the whole.

Ockham then considers a trio of objections to his denial that all artifacts have their own forms. First, an objector might say that Ockham has erased the distinction between natural things and artificial things. In reply, he concedes that he has, at least in some cases. Artifacts that are one *per se* just are natural things; his example is mercury or quicksilver, which is produced by the technique of smelting it from the surrounding rock. Such artifacts, he says, are "truly and really natural [*vere et realiter naturalis*]."²⁸ The contribution of the artisan (the smelter, in this case) is simply to take what is already a natural substance and reconfigure it by removing the dross and bringing its parts closer together. He further concedes that a statue made of bronze would be something one *per se*, although we need to be careful about calling it 'natural' because while bronze is natural, "no natural thing is naturally a statue" – including, presumably, lumps of bronze that just happen to look like sleeping giants. Ockham's answer to this is quite interesting. He says that some complex artifacts such as a house are natural in the sense that they are not a natural thing but natural things, in the plural. But there is more – and a good thing, too, as no difference has yet been specified in the nature of things between a house and the random heaps of wood and stones used to build it; they are natural things, in the plural, both. His more considered reply is to differentiate the natural from the artificial by appealing to the action of an extrinsic agent in the case of artifacts. Thus, there is no *intrinsic* difference between the water in a warm spring and in a bathtub: both are naturally water and both can be a bath. The difference is that "one is produced by nature and the other becomes a bath only by art and the concurrence of human will," so that "one would truly be called a natural bath and the other an artificial bath, i.e., one water becomes a bath naturally and the other artificially."²⁹

By shifting from adjectival to adverbial discourse in this way, Ockham suggests that the difference between natural things and artificial things is not in how they are but how they come to be.³⁰ But how do we conceive

²⁵ *Summula* I, cap. 20 (*OP* VI, p. 209, l. 11).

²⁶ See Des Chene 1996: 247. It should be pointed out that unlike Ockham, Suárez and the Conimbricenses were willing to speak of artificial forms in this sense.

²⁷ *Summula* I, cap. 20 (*OP* VI, p. 209, ll. 13–16): "aliquando artifice agente mediantibus causis naturalibus novae formae accidentales, et quandoque substantiales, de novo producuntur, sicut patet in agricultura et aliis artibus."

²⁸ *Summula* I, cap. 20 (*OP* VI, p. 211, ll. 56–57): "quaelibet res artificialis est vere et realiter naturalis."

²⁹ *Summula* I, cap. 20 (*OP* VI, p. 211, ll. 75–78): "unum fit a natura et aliud non fit balneum nisi arte et voluntate concurrente, vere unum diceretur balneum naturale et aliud artificiale, hoc est una aqua fit balneum naturaliter et alia artificialiter."

³⁰ Aristotle himself alludes to such an adverbial account of substances using artifacts as examples at *Metaphysics* VII.7, 1033a6–22, which would certainly fit Ockham's aim in the *Summula* of treating the these questions *secundum intentionem Aristotelis*.

of adverbial differences, or the efficient causality of the human artisan? Surely we are not inclined to say of a mechanically produced diamond, 'this is a real diamond all right, though it was made by art and the concurrence of human will'? – though perhaps Ockham could escape this by saying that synthetic diamonds are more like statues whereas real diamonds are more like mercury after smelting. In any case, we would be right to wonder whether this is really an ontologically low-impact way of understanding how things come to be.

The second objection advances a version of the view of Thomas Aquinas mentioned above, according to which artifacts have natural matter and artificial forms in just the way natural things have form and matter. To Ockham's mind, this is far too simplistic a way of understanding physical change, for things can come into existence not just by the addition of a form, but also by rearrangement (as in the cases of the statue and the broom), and subtraction (as in the smelting case). In both these latter cases, nothing, i.e., no thing, gets added to, or taken away from, the subject at the one terminus of change to make it what it is at the other.

The third objection is that Aristotle would not have rejected the proposition 'the statue is the bronze' in favour of 'the statue is brazen' if he thought that there is no difference between natural and artificial things. Here Ockham's solution is simply to point out that the first proposition is not unconditionally true, but holds only *per accidens*, since the statue is bronze not naturally, but by art. Likewise, it is a mistake to think that Aristotelian motion requires the absolute ceasing to be of what is at one terminus of the change and the absolute coming to be of what is at the other. Complex entities can change through the motion of their parts relative to each other, without anything new being added or destroyed.

Conclusion

Ockham sketches only the beginnings of a proper Aristotelian theory of artifacts in his *Summulae Philosophiae Naturalis*. But he gives us enough there to see how the rest of the account might go.

The first point is that artifacts are not new creations and do not involve the generation of any new form or substance. So where do they come from?

In typical medieval fashion, Ockham answers this by first disposing of the competition, in this case the Scotistic idea that composite artifacts bring something new into existence simply by being wholes, in virtue of the fact that their composition must be explained by an advening 'form of the whole'. Ockham's positive account then seeks to explain artifacts as contingent collections of things (in the plural) that already exist naturally,³¹ and, where this is not possible, to claim that certain processes such as animal and plant breeding and smelting do in fact produce things that are "truly and really natural," though not anew, but rather by reconfiguring or reshaping or enabling (natural) causal interaction between already existing substances. But such rearrangements do not count as new things in Ockham's ontology; their novelty is at most adverbial, in the sense that they result from the activity of the artisan, who, like a cook or flower arranger, places natural things in new settings. So the focus in artifacts is on human agents, and on the arts and sciences representing their collective wisdom, much like a recipe book. It is not a book of magic, giving humans the power to create new substances *de novo*. Thus, the breeding of new species is properly attributed to natural causes, cleverly harnessed by humans for their own purposes. In a different way, arts such as smelting might be said to 'unleash' base metals from their rocky surrounds, which in their pure state constitute real, *per se* unities. But in the vast majority of cases, artisans just move stuff around, creating *per accidens* unities that do not constitute new natural kinds, and the distinction between natural and artificial seems firm; even in the bathwater example, Ockham wants to say that one bath is natural and another artificial even though there is no intrinsic difference between them.

The rub in all of this would seem to be the ontological status of actions, especially the orchestrations, if you will, of human artisans. Ockham seems to have given us a way of understanding artifacts themselves that does not have ontology-enriching consequences, but how should we think about the process of rearrangement? Has Ockham simply sidestepped the ontological problem by emphasizing human activity, introducing not new things, but new modes or ways of becoming things, diachronically?

That is a question for another time, as a fuller account would need to need to bring in philosophers who were influenced by Ockham in their own commentaries on Aristotle's *Physics*. About that influence there is no question. We can see it just a generation later, in the writings of the great Parisian nominalist, John Buridan (c. 1300–61), who tells us, "Aristotle did not intend to posit a difference between artificial things

³¹ As Normore 2006 nicely puts it, for Ockham, "artifacts just are ways natural things are; and if we are to speak of their parts we have to speak of the natural things or the parts of those natural things" (p. 747).

and natural things because artificial things *are* natural and do not differ from natural things. But he did wish to posit a difference between the names 'natural thing' and 'artificial thing', or between the concepts attached to those names."³²

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The author has no competing interests to declare.

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³² John Buridan, *Quaestiones super octo libros Physicorum Aristotelis* II.2: "Aristoteles non intendebat ponere differentiam rerum artificialium a rebus naturalibus, quia res artificiales sunt res naturales et non differunt ab eis." (John Buridan 2015: p. 254, ll. 23–25).

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