

*Aristotle on Nature, Deliberation, and Purposiveness*

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In *Physics* 11.8, Aristotle draws an analogy between craft (*technē*) and nature: nature, like craft, is the type of cause that is ‘for the sake of something’ (*heneka tou*, 198b10–11; 199b32–3). He considers – and dismisses – an objection to this analogy. The objection is that craft productions involve deliberation in a way that natural processes do not, and that this undermines the alleged analogy. Perhaps processes of craft production are only ‘for the sake of something’ because they originate in deliberating agents. If so, then this gives us no reason to think that natural processes will similarly be for the sake of something. In response, Aristotle says that it would be absurd to maintain that a thing cannot have come to be ‘for the sake of something unless the mover is seen to have deliberated’ (199b26–8). In fact, he claims, even craft does not deliberate (199b28).

Aristotle’s response to this imagined objection is puzzling.<sup>1</sup> What does he mean by the claim that craft does not deliberate? How is this claim compatible with the manifest fact that craftsmen, in order to exercise their crafts successfully, often need to think about what to do? Equally puzzling, however, is the fact that Aristotle takes *this* to be the objection that needs answering here. It might seem that there is a more pressing objection he should have considered. This more pressing objection would come from an opponent who claimed that a process could only be end-directed if it originated in desire and cognition (where ‘cognition’ might include either perception or rational cognition). Such an opponent would agree that nest building and web spinning are end-directed processes, and that when

The earliest version of this chapter was written for a conference at St Andrews in honour of Sarah Broadie’s seventieth birthday. I presented later versions at the Humboldt University in Berlin and at University College London. On all these occasions, I benefited a great deal from questions raised by the audience. In particular, I would like to thank Christopher Shields for pressing me to think more about Aristotle’s odd counterfactual claim that if the shipbuilding craft were in the wood, it would operate just as nature does. I would also like to thank Barbara Sattler for her comments on the penultimate draft.

<sup>1</sup> This chapter is a response to the thought-provoking discussion of these puzzles in Broadie 2007b.

swallows build their nests and spiders spin their webs, they ‘make things not by craft, and without having enquired or deliberated’ (199a20–1). But this opponent would dispute Aristotle’s claim that *processes of growth* can be end-directed, given that such processes do not stem from desire or from any kind of cognition of the end that is supposedly aimed at. Does Aristotle’s answer to the objection from deliberation provide any hints as to how he might respond to this more challenging opponent?

I shall argue that Aristotle’s remarks about purposiveness and deliberation hint at an interesting defence of natural teleology. In doing so, however, they suggest a puzzle about the kind of purposiveness we ordinarily take to be less problematic: the purposiveness involved in many ordinary, non-craft-based human intentional actions.

### 9.1 Craft and Nature: The Context in *Physics* II.8

What exactly does Aristotle mean by the claim that nature is one of the causes that is ‘for the sake of something’ (198b10–11; 199b32–3)? Earlier in *Physics* II, he says that the type of cause that is ‘for the sake of something’ (*heneka tou*) is an end (*telos*, II.3, 194b32–5) and that nature is an end (*telos*) and what something is for (*hou heneka*, II.3, 194a28–9). This might suggest that his aim, in II.8, is to defend the view that nature is a final cause. However, there would be something slightly odd in invoking the craft analogy in defence of *this* claim. As he also says earlier in *Physics* II, craft is *not* the final cause of craft production (whereas nature is the final cause of natural processes): ‘doctoring is not a process aiming at the craft of medicine, but aiming at health; for it is necessary that doctoring is from the craft of medicine, not towards it’ (II.1, 193b14–16). In spite of this difference, there is an important way in which nature and craft are alike: both are efficient causes of processes (and states) that are for the sake of something. I take it that this is the point he is making when he claims in II.8 that nature is like craft in being a cause for the sake of something.

In *Physics* II.8, Aristotle makes two positive claims about the role of purposiveness in nature:

- (i) The ‘for something’ is present in natural things (i.e. natural things are the way they are, and develop as they do, because being this way, and developing in this way, is good for them) (199a7–8).
- (ii) In an end-directed natural process, (a) the earlier stages come about for the sake of the later stages, and (b) these stages come about in this

way *by nature* (i.e. the causal role of nature explains the fact that the earlier stages come about for the sake of the later ones) (199a11–12).<sup>2</sup>

He defends (i) with his argument against Empedocles in 198b10–199a8. He defends (ii) by invoking the analogy between nature and craft. Thus, in 199a12–15, he argues that if a process of craft production (such as house-building) were to come about by nature, it would come about in just the way that it does in fact come about by craft, and that if things that come about by nature were to come about also by craft, they would come about just as they do in fact come about by nature.<sup>3</sup> From this, he concludes that the relation of later stages to earlier stages in a natural process is just like the relation of later stages to earlier stages in processes of craft production (199a18–20). In both types of process, the earlier stages occur for the sake of the later ones and, moreover, the causal role of *nature* in explaining why natural processes are structured in this way is analogous to the causal role of *craft* in explaining why processes of craft production are structured in this way.<sup>4</sup>

To claim that a natural thing develops as it does (in such a way that the earlier stages are for the sake of the later stages) *because of that natural thing's nature* is to rule out various other alternative views. One alternative, for instance, would be to hold that natural things develop in this way because they are themselves the products of craftsmanship (perhaps, of a divine craftsman). Another alternative would be to hold that a natural thing develops in this way, not because of its own specific nature, but rather because of some source of change that belongs to the cosmos as a whole.<sup>5</sup> If Aristotle can show that there is an analogy between craft and nature, this

<sup>2</sup> There are two respects in which (ii) goes beyond (i). (i) says generally that there is end-directedness in natural things. (iia) makes the claim that there is a *specific type* of end-directedness in natural things: in a natural process, the earlier stages are for the sake of the later stages. (iib) goes still further: it makes a claim about the role of nature in explaining the claim made in (iia).

<sup>3</sup> In support of this latter claim, he points out that certain crafts (such as medicine) attempt to imitate or improve upon what normally happens by nature (199a15–17).

<sup>4</sup> For my understanding of these lines, I am indebted to Kelsey (2011) and Kress (2019). Kelsey argues (against Granger 1993) that Aristotle is not invoking an analogy between natural processes and human actions with his use of the verb *prattein* in 199a8–9 (although obviously Aristotle does draw an analogy between natural processes and actions of craft production in the later lines, 199a18–20). Elsewhere, Aristotle is quite prepared to use the verb *prattein* in describing both what is done by thought and what is done by nature (196b22). Kress (2019) argues that the craft analogy is meant to support the claim that it is *by nature* that earlier stages occur for the sake of later stages in natural processes, and that what this means is that nature acts as an efficient cause of earlier-stages-occurring-for-the-sake-of-later-stages in such processes.

<sup>5</sup> Broadie (2007b) argues that the role of the craft analogy, in the second half of the chapter, is to justify the view that final causality operates on the level of individual natures, rather than on the level of the cosmos as a whole.

will help him to rule out both alternatives. We do not *need* to invoke craft as a cause whenever there is purposiveness, if nature can play an analogous causal role.<sup>6</sup> Moreover, if a particular living thing's nature is analogous to a craft, then that living thing's own nature (rather than some more general cosmic nature) will explain the purposiveness of its behaviour.<sup>7</sup>

## 9.2 The Claim That Craft Does Not Deliberate

In defending the analogy between craft and nature, Aristotle claims that craft (like nature) does not deliberate. Clearly, individual craftsmen often think about what to do in the course of exercising their craft. What, then, does Aristotle mean by this claim? Two different interpretations have been proposed. According to the first, his point is that the craftsman *qua craftsman* does not deliberate. According to the second, his point is not about the craftsman (even considered *qua craftsman*), but about the craft itself: *the craft* does not deliberate (even if the craftsman does). In deciding between these interpretations, we should bear in mind two criteria of adequacy. A successful interpretation should attribute to Aristotle a view that is consistent with his remarks about deliberation elsewhere; and a successful interpretation should allow us to explain how establishing that 'craft does not deliberate' might contribute to Aristotle's argument that there is an important analogy between nature and craft.

Sarah Broadie has argued that Aristotle's point is that the craftsman, *qua craftsman* does not deliberate.<sup>8</sup> On Broadie's interpretation, Aristotle is saying that the craftsman *par excellence* doesn't have to deliberate, even if the actual craftspeople we encounter often do. Deliberation is the sign of a kind of failure of expertise. A truly skilled craftsman doesn't have to ponder what to do. He just sees straight away that the way to build the

<sup>6</sup> Of course, this is not enough to show that it is nature, rather than craft, that plays this causal role in the development of natural things. Perhaps Aristotle could defend that view by appealing to his brief remarks about the priority of nature over craft (199a15–17): if craft imitates and completes nature, that might suggest that the existence of craft presupposes the existence of some non-craft-based natural teleology. In any case, as Sedley points out (2010, 7), Aristotle's views on divinity rule out the possibility of divine craftsmanship.

<sup>7</sup> Note, however, that the analogy with craft might also suggest that there are structural relations between natures, with some being subordinate to (and for the sake of) others, just as some crafts are subordinate to (and for the sake of) others. For example, the craft of bridle making is for the sake of the craft of horse riding, which in turn is for the craft of generalship (*Eth. Nic.* 1.1, 1094a10–14).

<sup>8</sup> Broadie 2007b.

house is to lay the foundations like this. He doesn't have to stop and think and wonder whether to lay them like this or in some other way.<sup>9</sup>

However, this interpretation is difficult to reconcile with Aristotle's remarks about deliberation elsewhere. He discusses deliberation in *Nicomachean Ethics* 111.3 and *Eudemian Ethics* 11.10. Both passages provide evidence that he takes the craftsman, qua such, to engage in a certain kind of thinking about what to do, and that he is prepared to describe such thinking as deliberation. In both passages, he says that one deliberates not about the end, but rather about how best to achieve the end, and in both passages he illustrates this point with examples from craft production. At *Eudemian Ethics* 11.10, he says that the doctor would deliberate whether to administer some drug (1227a19–20). At *Nicomachean Ethics* 111.3, he says that the doctor does not deliberate about whether to heal, nor does the orator deliberate about whether to persuade; instead, having set the end, they enquire how and by what means it is to be attained (1112b12–16). This latter passage is, I think, especially revealing for our purposes. When Aristotle says that the doctor does not deliberate about whether to heal, he must mean that the doctor *qua doctor* does not deliberate about this. After all, it would clearly be false to insist that the people who are doctors never engage in such deliberation. He goes on to contrast this with a kind of enquiry in which doctors (and other craftsmen) do engage: working out how to achieve their end. The point of the contrast must be that the doctor, qua doctor, *does* engage in *this* kind of thinking, and that in doing so he is engaging in craft-deliberation. If Aristotle meant to deny that the doctor qua doctor engages in any kind of deliberation, then it would be very odd for him to emphasise here just that the doctor qua doctor does not deliberate about the end. Aristotle is here invoking as an example the kind of deliberation engaged in by a craftsman (when acting qua craftsman) and is doing so in order to illustrate a more general point about deliberation: the point that deliberation is not about ends, but about how to achieve those ends.<sup>10</sup>

<sup>9</sup> A more radical version of this thought (also suggested by some of Broadie's remarks): certain skilled craftsmen do not have to think at all, but instead operate by a kind of muscle memory (e.g. a skilled musician or dancer). However, as we shall see, in the *Nicomachean Ethics* Aristotle takes the kind of craft that does involve thought/deliberation as a paradigm of craft. And even the activity of the skilled musician is, in a sense, thought-guided: the process by which such a skill is acquired necessarily involves thinking, and the exercise of such a skill requires a kind of intelligent responsiveness (a responsiveness that need not be manifested in episodes of thinking).

<sup>10</sup> This also tells against Müller's claim that Aristotle does not count productive thinking as deliberation. Müller (2018) argues that there are certain important differences between productive thinking and practical thinking. But even if Müller is right about this, Aristotle's remarks in *Nicomachean*

Admittedly, Aristotle does distinguish between kinds of expertise that involve deliberation and kinds that do not. At *Eudemian Ethics* II.10, he asks ‘why do doctors deliberate about matters within their science, but not grammarians?’ (1226a34–5). At *Nicomachean Ethics* III.3, he says that there is no deliberation in the sciences (*epistēmai*) that are ‘exact and self-contained’, such as grammar; rather we deliberate about things that can be brought about by our efforts, but not always in the same way, for example about medicine or moneymaking (1112a34–b4). We deliberate more about navigation than about gymnastics, since the former has been less exactly worked out; generally, we deliberate about crafts more than about sciences, as we are more in doubt about the former (1112b5–8).

These remarks might be invoked in support of Broadie’s suggestion that a perfect craftsman would not need to deliberate. After all, Aristotle says here that crafts only depend on deliberation *to the extent that they are less fully worked out*. However, it is not obvious that he means this to imply that a craftsman *par excellence* would have no need of deliberation. For that to follow, Aristotle would need to think that each craft could in principle be developed into a perfected form, which left no room for deliberation. The fact that doctors and navigators need to deliberate would then simply be a sign of the relatively undeveloped state of the crafts of medicine and navigation. But Aristotle gives no indication that this is his view, and there is some reason to think the opposite. Medicine and navigation are crafts that must deal with particular circumstances, liable to changing in unpredictable ways. This suggests that it is in the nature of such crafts to depend upon deliberation, and that when Aristotle says that they are less fully worked out, he means that they are the kinds of crafts in which it is impossible to work out everything in advance.<sup>11</sup> Of course, Aristotle does say, in *Nicomachean Ethics* III.3, that certain types of expertise are not like this. If grammatical expertise (*epistēmē*) counts as a craft, then this implies that a certain *kind* of craft can be exercised without deliberation. But this is unlikely to be the point Aristotle is making in *Physics* II.8. The claim he makes there is quite general (‘craft does not deliberate’), and the example of a craft he goes on to invoke in support of this claim is shipbuilding

*Ethics* 111.3 suggest that he is prepared to describe both kinds of thought as deliberation. Moreover, if ‘craft does not deliberate’ (in *Ph.* 11.8) meant merely that the craftsman’s thinking is productive (not practical) and hence does not *count* as deliberation, then Aristotle’s opponent would have an obvious reply: he could claim instead that for there to be purposiveness, the moving cause must engage in thought (either productive or practical).

<sup>11</sup> In Coope 2021, I argue that Aristotle has reason to suppose that crafts (or at least, crafts of this sort) depend on deliberation, in a way that theoretical understanding does not depend on enquiry.

(199b28–9).<sup>12</sup> Shipbuilders are presumably just the kind of craftsmen who need to make use of deliberation, adjusting what they do to account for variable materials or for unexpected circumstances.

David Sedley has recently defended an alternative interpretation.<sup>13</sup> On this view, when Aristotle says that ‘craft does not deliberate’ he means not that the craftsman, ideally, does not deliberate but rather that the *craft itself* does not deliberate. Aristotle’s point is that the cause of the movement in the case of craft production is not, strictly speaking, the craftsman but rather the *craft itself*. And the craft itself is not the kind of thing that deliberates (even if the craftsman does). This interpretation makes it possible to reconcile the claim ‘craft does not deliberate’ with the passages in which Aristotle implies that craftsmen, qua craftsmen, do deliberate.

However, any defence of Sedley’s interpretation needs to answer the following challenge. On this interpretation, Aristotle’s opponent seems to be left with an obvious reply. The opponent can simply point out that the fact that craftsmen deliberate is itself an important difference between processes of craft production and the kinds of natural processes that occur in plants (or indeed in non-human animals). Even if Aristotle thinks that the craft is the primary or ultimate efficient cause of a process of craft production,<sup>14</sup> he certainly thinks that craftsmen (and, more generally, deliberators) count as efficient causes *in some sense*. At II.3, 194b30, the man who has deliberated is Aristotle’s first example of an efficient cause; at 195a30–1, the doctor is said to be the cause of health; at 195a21–3, ‘the seed and the doctor and the one who has deliberated, and generally the maker’ are said to be efficient causes (sources whence the change or rest originates). Why, then, is it relevant to point out that in craft production the *primary* cause is not the kind of thing that deliberates? If craft production necessarily involves a deliberating craftsman, why isn’t *this* enough to show that craft production is importantly disanalogous to a natural process (such as the growth of leaves)? Aristotle’s opponent could claim that processes of craft production are only purposive because they are brought about by an agent who deliberates, even if the primary cause of such processes is not the deliberating agent but rather the craft this agent possesses.

<sup>12</sup> Earlier in the chapter, he mentioned housebuilding (199a12–13), and (in discussing the fact that craftsmen can make mistakes) both grammatical expertise and medicine (199a33–5).

<sup>13</sup> Sedley 2010.

<sup>14</sup> At 195a6, the art of sculpture is cited as an efficient cause of the statue. At 195b5–6, Aristotle says that the housebuilder (or the housebuilder building) is the cause of the house, but he later adds that the housebuilder builds ‘in virtue of’ (*kata*) the craft of building, so this cause (the craft of building) is prior (195b21–5).



In what follows, I suggest a way to meet this challenge, and hence to defend (a version of) Sedley's interpretation. My suggestion will be that Aristotle is assuming a general view about causation: the primary cause of a purposive process must be what gives that process its purposive character. If the primary cause of craft production is the craft itself (not the craftsman), then what gives a process of craft production its purposive character is something (namely, the craft) that does not deliberate. If this is so, then in pointing out that craft does not deliberate, Aristotle is implying that craft production does not get its purposive character from any process of thought or deliberation. In Section 3, I ask how Aristotle might defend this claim about the source of purposiveness.

### 9.3 Craft, Deliberation, and the Purposiveness of Craft Production

Aristotle imagines an opponent who claims that processes of craft production are only purposive because of the deliberation of the agent. Presumably, the imagined opponent would argue as follows. Consider an example of craft production, such as cobbling. The cobbler moistens the leather *for the sake of softening it*. This action of moistening is for the sake of softening, just because of the way in which it (the action) is caused by the cobbler's thought processes: by the cobbler's thinking that moistening the leather is a good way to soften it. From this the opponent concludes that, in the case of craft production, the source of purposiveness is deliberation. When *x* happens for the sake of *y*, in craft production, this is because *x* is brought about by a thought process of this kind. Finally, the opponent generalises this to all cases in which one thing occurs for the sake of another, concluding that the source of purposiveness, in any individual case, must be deliberation.

There are two points Aristotle might make in reply. The first is that deliberation itself is a purposive process, and that the opponent cannot explain *its* purposiveness. I shall argue that any attempt to explain *this* purposiveness threatens to embroil the opponent in an infinite regress of explanations. The second point is that, once we understand deliberation's role in processes of craft production, we shall see that its role is not to explain the *purposiveness* of such processes. Aristotle hints at the role of deliberation in craft production when he says that it would not be needed if craft were (like nature) an internal origin of change. I shall argue that, for Aristotle, deliberation is needed in craft production just because of this crucial way in which craft differs from nature.

Aristotle brings out the purposive nature of the deliberative process in some remarks in *Eudemian Ethics* II.10:



[T]he one deliberating always deliberates for the sake of some end, and he who deliberates has always an aim by reference to which he judges what is beneficial. (1227a6–7)

Deliberation is a kind of enquiry (a process of working out what to do), and enquiry is an end-directed process (*Eth. Nic.* III.3, 1112b22–3). If you find out the answer to some question as a result of enquiring into it, then you must have been aiming to find out the answer to that question. That is the difference between discovering something through enquiry and merely happening upon some new knowledge. Moreover, deliberation is end-directed in a further way. When we deliberate, we are not merely aiming to answer some question ('given my circumstances, what would be the best way for me to achieve such-and-such a goal?'); we deliberate for the sake of acting. Mere idle reflection on the best way to bring about some goal would not count as deliberation. That is why we only deliberate about things in our power (as Aristotle emphasises in *Eth. Nic.* III.3), and we stop deliberating when we realise that it is impossible for us to achieve the goal we have set ourselves (*Eth. Nic.* III.3, 1112b24–6). When we engage in *craft-deliberation*, we deliberate in order to produce something: the shipbuilder deliberates for the sake of producing a ship.

If this is right, then Aristotle has an answer to the opponent who assumes that a process can only be purposive if it is caused by prior deliberation. If deliberation is itself a purposive process, then such an opponent would be committed to an infinite regress: any deliberative process would need to be caused by a prior deliberative process.<sup>15</sup> As Aristotle himself says in the *Eudemian Ethics*, deliberation cannot presuppose prior deliberation: 'For one does not deliberate after previous deliberation which itself presupposed deliberation, but there is some starting point; nor does one think after prior thinking and so on *ad infinitum*' (VIII.2, 1248a18–22).

What, then, is the role of deliberation in craft production? If originating in deliberation is not required for purposiveness, why is deliberation needed in craft production? Aristotle hints at an interesting answer to

<sup>15</sup> Of course, this only answers *an opponent who assumes that a process can only be purposive if caused by prior deliberation*. A different opponent might claim only that *actions of craft production* must be preceded by deliberation if they are to be purposive (allowing that the purposiveness of *the deliberative process itself* need not be explained in the same way). But this second opponent would be on much weaker ground in claiming that natural processes cannot be purposive, since she would have conceded that there *can* be purposive processes that do not originate in deliberation. This would leave open the possibility that natural processes are like *processes of craft deliberation* in being purposive without themselves originating in deliberation.

this question in *Physics* 11.8. Immediately after saying that craft does not deliberate, he goes on to make a peculiar counterfactual claim: if the craft of shipbuilding were present in the wood, it would act in the same way as nature (199b28–9).<sup>16</sup> This suggests that craft production differs from a natural process (and depends upon deliberation in a way that a natural process does not) just because craft differs from nature in being an external cause.

Earlier in *Physics* 11, Aristotle has explained the sense in which nature (unlike craft) is an internal cause of the processes that occur in a natural thing: nature is ‘a sort of source and cause of change and of remaining at rest in that to which it belongs primarily and of itself, that is, not by virtue of concurrence’ (11.1, 192b20–3). By contrast, the craft of housebuilding operates on something external to the housebuilder (the bricks) to produce a house (192b28–30). Even when a doctor cures himself, using the craft of medicine, he is only accidentally both doctor and patient: he is healed *because he is acted upon by someone who possesses the craft of medicine* (someone who happens to be identical to himself), he is not healed *in virtue of possessing the craft of medicine*. As Aristotle says, ‘it is not insofar as he is healed that he possesses the craft of medicine, but being a doctor and being healed merely concur in the same person’ (192b25–6).

This difference between craft and nature has two implications, both important for our purposes. First, a craft differs from a nature in being accidental to whatever possesses it. When we consider the shipbuilder *qua* shipbuilder, we are engaging in a kind of fiction: we are considering the shipbuilder as if he were essentially a shipbuilder. In fact, any shipbuilder is only accidentally a shipbuilder; what he is essentially is a human being. By contrast, when we consider a natural thing, *qua* the natural thing it is, no fiction is involved. How a thing is by nature is how it is essentially. Second, the relation between nature and the matter on which it operates is different from the relation between craft and the matter on which it operates (for example, the relation between an oak’s nature and the wood that is the oak’s matter is different from the relation between the craft of shipbuilding and the wood that is used in making a ship). This is because of the way in which craft, unlike nature, is an external source of change. I shall argue that both of these differences between craft and nature are relevant to our question about deliberation.

<sup>16</sup> In fact, as we saw above, Aristotle has already made a similar claim earlier in the chapter: if a house were one of the things that comes to be due to nature, it would come to be just as it does in fact come about by craft (199a12–13).

Aristotle tells us that if the shipbuilding craft were present in the wood, the wood's development into a ship would be just like a natural process. I take it that this counterfactual is inviting us to imagine a situation in which the craft is not merely present in the wood (in the way that the craft of medicine is present in the doctor when the doctor heals himself), but rather a situation in which the craft is present in *and essential to* the wood (as a nature is present in and essential to a natural thing). When Aristotle says that in that case, the wood's development into a ship would be just like a natural process, he is claiming that this development would still (like ordinary shipbuilding) be end-directed, but it would occur without any need for prior deliberation.

Aristotle's claim, then, is that deliberation is needed in craft production just because craft is unlike nature in these two respects: it is accidental to the thing that possesses it, and it is external to the matter on which it operates. It will help us to understand the role of deliberation in craft production if we look more closely at each of these two ways in which craft differs from nature.

The first difference was that a natural thing's nature is essential to it, whereas no craft is essential to its possessor: nothing is essentially a housebuilder or a doctor. I want to argue that this difference introduces a need for a special kind of flexibility in craft production, a kind of flexibility that is not called for in natural processes. The reason for this is that a process of craft production (unlike a natural process) is always subordinate to some further end. A nature is, in this respect, importantly different from a craft. Since a natural thing is essentially the way it is by nature, a thing's nature is not subordinate to some further end: its nature sets its end. By contrast, when a particular agent engages in craft production, the ultimate end for the sake of which he acts is not determined by the craft itself. A doctor may exercise his craft because he has been ordered to do so by his employer, or because he wants to help a friend, or because he wants to demonstrate his skill, and in exercising his craft he may be aiming to heal, or he may be aiming to make the patient just well enough for some particular purpose (for instance, well enough to do his job), or he may even be aiming to make the patient ill.<sup>17</sup>

<sup>17</sup> As Aristotle says, rational powers such as crafts are powers for opposites (*Metaph.* 1x.2). Of course, health is the proper end of the craft of medicine, so if there could be an agent who was essentially a doctor, that agent would exercise his craft only to heal. But in fact, no agent is essentially a doctor. Anyone who is a doctor is essentially a human being. Thus, any actual doctor will have other, further ends that influence the ways in which he uses his skill at doctoring.

Because of this, a craftsman is often called upon to exercise his craft in circumstances that are not well-suited to the exercise of that craft. A shoemaker may be called upon to make shoes from leather that is unsuitable (*Eth. Nic.* 1.10, 1101a3–6); a doctor may be called upon to treat someone who cannot be fully cured (*Rh.* 1.1, 1355b12–14), or to treat someone in circumstances in which suitable drugs are not available. Moreover, a craftsman may need to exercise the craft for some non-standard purpose: the shoemaker who is a prisoner of war may use his craft to make faulty shoes for enemy soldiers, a doctor may use his craft to harm his enemies. Both these points help to explain the need for deliberation: an excellent craftsman needs to be able to exercise his craft in a range of unpredictable circumstances, and for a great variety of ends. Being a good doctor requires more than the ability to heal potentially curable patients in circumstances in which all the appropriate drugs and instruments are available.

The second difference between nature and craft is related to the first. Crafts and natures are differently related to the matter on which they operate. Aristotle hints at this difference between craft and nature earlier in *Physics* 11. The crafts, he says, ‘make their matter, some make it *simpliciter*, others make it good to work with’ (11.2, 194a33–4). The same is not true of nature: ‘In the case of artefacts, we make the matter for the work to be done, whereas in the case of natural objects, it is there already’ (11.2, 194b7–8).<sup>18</sup>

One reason for this difference is that, in many cases, a natural thing’s nature operates on matter that is internal to the natural thing – matter that is already potentially in the state that will be brought about by the operation of this nature. By contrast, a craft operates on matter that is external: matter that could equally well be made into a variety of different things. When dog-form is operative in the coming-to-be of a dog, it is already in material suitable for becoming a dog (material that is not, in the same sense, suitable for becoming anything else). Although the dog’s form does explain the development of its material parts (and *in that sense*, nature does make the matter), it does so by operating on matter that is, from the start, such-as-to-be-a-dog. By contrast, the craft of shipbuilding is external to the wood it operates on. The wood could equally well be made into a number of different things. Moreover, often a shipbuilder is required to operate in circumstances where the ideal matter is not available. Shipbuilding can still be well exercised in such circumstances. Indeed,

<sup>18</sup> On the importance of this distinction between craft and nature, see Connell 2016, 123ff.

a shipbuilder might show his skill in producing a well-constructed ship out of the unsuitable material that is available.<sup>19</sup>

Of course, natural processes do sometimes involve interacting with external materials. Aristotle cites nest building as an example of a natural process (*Ph.* 11.8, 199a26–7).<sup>20</sup> Nest building is not the exercise of a craft, but when birds build nests, they clearly act on material that is external to them, and this is material (twigs and mud) they have to seek out. In the *Historia animalium*, Aristotle even points out that birds sometimes make use of alternative materials, when the most suitable are not available: the swallow ‘mixes mud with the stalks [of straw]. And if she lacks mud, she moistens herself and rolls her feathers into the dust’ (1x.7, 612b23–5).<sup>21</sup> However, I want to argue that even in this kind of case, the way in which the nature is related to the material it operates on differs from the way in which a craft is related to its materials. This is because of the way in which a nature is related to a natural habitat.

Living things are, by nature, such as to live in a certain habitat, a habitat that provides them with the materials needed for engaging in natural activities such as nest building. For instance, marsh-dwelling birds lead their lives (by nature) in a way that is suitable to the habitat of marshes; riverbank-dwelling birds live their lives (by nature) in a way that is suitable to the habitat of riverbanks.<sup>22</sup> Of course, this does not guarantee that any particular bird will in fact be living in its natural habitat. Any particular bird might be living in captivity. Nevertheless, *if it is to engage in its natural activity*, the bird must be living in its natural habitat. The nest-building capacity that is natural to a certain kind of bird just is the capacity to build nests *in the habitat that is natural to it*. Thus, a marsh-dwelling bird will have a natural ability to build nests from materials found in marshes, while a riverbank-dwelling bird will have a natural ability to build nests from materials found on riverbanks. If this is right, then there is some reason to

<sup>19</sup> The craft of medicine is an interesting intermediate case. The body is, in a certain sense, material that is such-as-to-be-healthy. (As Aristotle says, there is a sense in which the craft of medicine is just imitating what nature would do if it were operating successfully.) Here my earlier point becomes important. Because the end for the sake of which the craft is exercised is set by something external to the craft, the craft can be used for many different purposes: a doctor might be required to display his skill even when the patient is in fact incurable, or a doctor might be required to use his skill to make the patient ill.

<sup>20</sup> This does not imply that the product of this process (a nest) has a nature. Nests have no internal principle of change. But Aristotle is committed to the view that birds engage in nest-building behaviour by nature.

<sup>21</sup> Aristotle takes this to show that there is a kind of thought (*dianoia*) that guides the behaviour of swallows. Nest building is thus quite similar to housebuilding, except that it is not guided by craft.

<sup>22</sup> For a much fuller defence of this claim than I can give here, see Gelber 2015.

think that a natural thing, when acting by nature, will typically have readily available to it the external objects with which it needs to interact. There is no similar reason for thinking that a craftsman, when exercising his craft, will have readily available to him the external objects he needs to use. Circumstances can, of course, be more or less conducive to the exercise of a particular craft, but the circumstances are not specified by the craft itself, and indeed they could not be specified by the craft, given that the craft itself does not set the ultimate end for the sake of which it is employed.

How are these differences between craft and nature relevant to the need for deliberation? The answer is that craft production is (in certain ways) more challenging than natural production. Exercising a craft involves seeking out suitable material, and the most suitable material might not even be available in the circumstances in which the craft is being exercised. My suggestion is that deliberation is needed in craft because craft production involves these extra challenges. Deliberation is needed, not for purposiveness, but for a certain kind of sensitivity to changing and unpredictable circumstances, and for the capacity to adjust one's behaviour accordingly. Successful craft production requires this kind of sensitivity, because the craftsman is often required to seek out matter and make it suitable, or even to make use of matter that is not particularly suitable, when that is all that is available.<sup>23</sup>

#### 9.4 Desire and Animal End-Directedness

I have argued that, although deliberation has an important role in craft, its role is not to explain the purposiveness of processes of craft production. Deliberation gives the craftsman a certain kind of flexibility: a flexibility that is needed both because craft production is subordinate to some further end and because of the way in which a craft is related to the matter on which it operates. But even in craft production, deliberation does not explain the purposiveness of the process. If so, then Aristotle has an answer to the opponent who objects that deliberation is needed for purposiveness.

<sup>23</sup> Aristotle does allow that something superficially similar happens in nature. Nature often makes use of residues, just because they are what is available (see *Gen. an.* 11.6, 744b15–16). But such residues are reliably available and are suitable for the purposes for which they are used. A nature operates within a specific habitat, where the appropriate kinds of matter will typically be available. Nature is not called upon (as craft is) to operate in an indefinite variety of possible circumstances. By contrast, the general must be able to use whatever army is available and the shoemaker must be able to make use of whatever leather is provided (*Eth. Nic.* 1.10, 1101a3–6).

However, as I pointed out earlier, it might seem that, in responding to this opponent, Aristotle is overlooking a potentially more challenging objection. What would Aristotle say to an opponent who claimed that desire (or, perhaps, desire plus cognition) is needed for purposiveness? Such an opponent would agree that the bird's nest building and the spider's web spinning are purposive, but would object to Aristotle's claim that trees put out leaves for the sake of sheltering their fruit or, more generally, that natural processes such as growth, that do not stem from desire, are purposive. I want to suggest that Aristotle could respond to this opponent in a similar way.

In the last section, I argued that deliberation is itself a purposive process, and hence that it cannot be what ultimately explains purposiveness. Similarly, I suggest, ordinary animal desires (though not processes) are themselves purposive. The sparrow does not *just happen* to be beset by the desire to build a nest. Rather, it has this desire *because building a nest is good for it*. Thus, a general explanation of the bird's purposiveness (of how it is that a bird can act and be a certain way for the sake of some good) needs to explain not only the purposiveness of its nest building but also the purposiveness of its *having the desire* for nest building. Aristotle's claim is that both of these kinds of purposiveness are explained by the bird's nature: it is *because of the bird's nature* that it desires to build (and builds) a nest for the sake of its good.

I have argued that deliberation is needed in crafts because craft production demands a kind of flexibility in responding to particular circumstances. Desire and cognition also make possible a certain (though lesser) kind of flexibility. Although animals are by nature such as to live in a certain habitat, they differ from plants in that they move around within this habitat. For instance, birds need to seek out nest-building materials. Because of this, animals need a certain kind of flexibility in their end-directed behaviour, beyond that required by plants. Although their natural habitat will be such as to provide them with the right kind of food and shelter, they still need the ability to seek out food and shelter within that habitat. Desire enables an animal to adjust its aims in response to changing circumstances: desiring now food, now warmth, now a hiding place, in accordance with what at any moment seems good. Perceptual cognition enables an animal to notice, within its environment, opportunities for satisfying such desires. If this is right, then desire and cognition (like deliberation) are important in explaining a certain kind of flexible end-directedness, but (like deliberation) they are not what explains end-directedness as such.



### 9.5 The Explanation of End-Directedness: A Puzzle about Human Intentional Action

What, then, does explain the purposiveness of end-directed processes? In the case of natural processes, Aristotle's answer is clear. The *nature* of a natural thing explains the end-directedness of its natural processes. For example, a particular apple tree's processes of leaf production *occur for the sake of some end* because of the apple tree's nature. This particular apple tree puts out leaves for the sake of protecting its fruit because, in the nature of apple trees, leaf development serves the purpose of fruit protection. *Physics* 11.8's analogy between craft and nature suggests that we should be able to give a similar account of the purposiveness of processes of craft production. For example, a particular cobbler's leather-moistening is *for the sake of some end* because of the structure of the craft of cobbling. This particular cobbler moistens the leather for the sake of softening it because, within the craft of cobbling, leather-moistening serves the purpose of leather-softening.

In this final section of my chapter, I raise some puzzles for this way of appealing to the analogy between craft and nature in the explanation of purposiveness. The first puzzle is about the role of craft in explaining the purposiveness of craft production. Can craft really be the ultimate explanation for such purposiveness? As we saw earlier, the end of craft production is always subordinate to some further end. I want to suggest that this gives us reason to doubt both the ultimacy and the generality of explanations of purposiveness that appeal to craft. It gives us reason to doubt the ultimacy of such explanations, because we can always ask of any craft: why does that craft exist and, in particular, what is the good that it serves? In Section 4, I argued that desire could not be the ultimate explanation of the purposiveness of animal movement, since the existence of animal desire is itself explained teleologically. An analogous argument suggests that a craft cannot provide the ultimate explanation of the purposiveness of craft production: the existence of the craft itself stands in need of teleological explanation.

The worry about generality arises because of the way in which methods of craft production are often employed for non-standard ends, or modified to take account of unusual circumstances.<sup>24</sup> The appeal to craft above relies upon the fact that, within the craft of cobbling, moistening is a *standard method* for softening leather. This kind of craft-explanation is thus

<sup>24</sup> As we saw above, these features of craft production help to explain why it often requires the exercise of deliberation.

analogous to nature-explanation, in the way it invokes generality. However, many particular processes of craft production will depart from the use of such standard methods. As we saw in Section 3, such departures may be caused by the particular circumstances in which the craft is exercised (e.g. if the most appropriate materials or instruments are unavailable), or they may be caused by the peculiar purposes for which the craft is being exercised (e.g. if the employer wants a house made of glass, or if the doctor is being employed to make someone ill). These non-standard processes of craft production are still purposive, but it is not very clear how the structure of the craft itself could explain such purposiveness.

In fact, this suggests a further, more general, puzzle. There are many purposive activities that are neither natural processes nor exercises of some craft. Examples are ordinary human intentional actions that are not instances of craft production.<sup>25</sup> But the model of explanation suggested by *Physics* 11.8 seems to leave a puzzle as to how the purposiveness of such actions is to be explained. Is there anything that plays a role analogous to nature (or indeed craft) in the explanation of these actions? In the special case of *virtuous* actions, perhaps virtue might play such a role. For example, when the soldier volunteers for a dangerous mission in order to save the city, we could explain the purposiveness of this action by appealing to the virtue of courage: it belongs to the virtue of courage to act in such ways for the sake of the city. But whatever the merits of this explanation, it is hard to see how it could serve as the model for a *general* account of purposiveness. After all, there are many human intentional actions that are neither virtuous nor the exercise of some craft.

In this chapter, I have attempted to shed light on Aristotle's account of the purposiveness of natural processes. In particular, I have suggested how he might defend the claim that a thing's *nature* is what explains the purposiveness of its natural activities. I have asked whether any analogous explanation could be given for the purposiveness of other processes and activities. Aristotle's analogy between craft and nature might lead us to expect such an explanation. However, I have argued that, for many human intentional activities, it is hard to see what such an explanation would be. That leaves us with a puzzle about explaining the purposiveness of such activities. Should

<sup>25</sup> At *Nicomachean Ethics* 11.1, Aristotle argues that the ethical virtues do not arise in us by nature (1103a18–26). His argument is that nothing that is by nature a certain way can be habituated to be otherwise than it is by nature (by contrast, a stone falls downwards by nature, and cannot be habituated to fall in some other way). The same argument seems to imply that when human beings engage in particular intentional actions, they do not do so 'by nature'. For a human being can be habituated to act otherwise than she would have acted had she not been so habituated.

we accept that there are simply two very different kinds of explanation of purposiveness, the first appropriate for natural processes (and possibly for virtuous actions and certain standard instances of craft production) and the second appropriate for the other kinds of intentional actions engaged in by an adult human being? Can an explanation of the second kind in some way be derived from or based upon an explanation of the first kind? The real puzzle we are left with by *Physics* 11.8 is not that of explaining the purposiveness of natural processes; it is, rather, that of explaining the purposiveness of those processes that are purposive but are *not* natural.

