

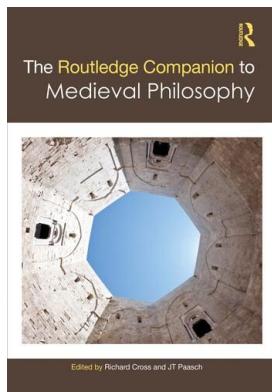
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### Causality

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## CAUSALITY

*Graham White*

Philosophy was mostly practiced in the Middle Ages as an academic discipline and, consequently, in the milieu of a medieval university. At that time, the dominant mode of academic writing was a commentary on some authoritative text; what we would call philosophy occurred in what was called the arts faculty, where explicitly philosophical books were commented on, but also in the so-called higher faculties of theology, law, and medicine.

All of these factors meant that reasoning about causality was a dominant theme in medieval thought. Aristotle was seen as being very authoritative, and causal reasoning is pervasive in Aristotle. Furthermore, theology, law, and medicine are (or were in that period) very concerned with causality: medicine for obvious reasons, law because much of law has to do with agency, which is a causal notion, and theology because theologians deal with concepts like miracles, and miracles were defined in the Middle Ages in basically causal terms (Bartlett 2008). Now it is rather unfortunate that, with few exceptions, most of the modern literature on medieval thought concentrates on what was written by theologians, rather than by physicians or lawyers: there are probably treasures to be found in those sources, but few modern scholars, apart from specialists in law or medicine, have had the expertise (or the courage) to look.

Unfortunately, all of this makes the medieval literature somewhat obscure and confusing to the uninitiated. Commentaries are, of course, written in the order of the original text, which means that the interesting parts of the comments may not occur in any obvious place. This is particularly true of theological texts, many of which are commentaries on Peter Lombard's *Sentences*, which was a rather loosely ordered collection of theological citations. Thus, there are interesting discussions on the analysis of continuous change in the commentaries on a certain passage in the *Sentences* (Book 1, Distinction 17), a passage where Peter discusses whether the amount of divine grace that a person has can increase. There are similar situations scattered throughout the commentary literature where topics have been, as it were, hijacked and used to host subtle technical discussions. Modern editions and translations often have good indexes, and one should use them.

A related difficulty is that discussions of causality, and even quite general discussions of causality, tend to occur in contexts which are quite unfamiliar to modern readers. The discussion of continuous change in the context of the increase of divine grace is a case in point. Modern philosophers tend to know, for example, the way in which causal issues come into discussions of perception, and can deal with the way in which the literature on perception handles the interrelation of general issues of causality with specific perception-related issues. But it is much more difficult to arrive at a corresponding understanding of many of these medieval texts, even when they contain material which is quite unrelated to the theological issues which the texts are ostensibly about.

And, finally, the medievals were very concerned with logical argument. The medieval equivalent of the seminar was the disputation, in which one participant (the respondent) would undertake to defend a position, while others would attempt to disprove it using logical arguments, which the respondent would have to deal with (Angelleli 1970). This led to a great interest in questions of validity and consistency, rather than just truth and falsity: and it seems often as if positions were investigated for their logical interest, rather than solely for the pursuit of truth.

## The World Picture

There are certain background assumptions about how the medievals saw the world which one has to take into account in reading their work.

### *Teleology*

We begin with teleology. On the face of it, this is one of the issues over which medieval and contemporary philosophy differs most strikingly. The medievals generally believed that there was far more final causality in the world than we do: we, when we entertain talk of final causes or purposes, only do so in a limited number of cases (most of them to do with human actions or humanly made artifacts) in which final causality can obviously be reduced to efficient causality. The medievals, however, seem to have had no such inhibitions: for them, final causality was everywhere, although they also did think that, in many of these cases, final causality could still be reduced to efficient causality.

There are two main issues at work: both of them mark significant differences between medieval and contemporary thought, although neither of them is a result of naiveté on the part of medieval authors.

The first is that almost all of the medievals believed that the world was created by God for the purpose of the history that would unfold in it. So, in a sense, everything that happened in this world happened for a purpose. But this position does not entail, without further assumptions, that instances of final causality could not be reduced to instances of efficient causality, and the medievals were generally aware of this. Neither does this entail that the resulting teleology—that of things happening for a purpose—could be rationally proved starting from merely natural knowledge: certainly, some medievals (such as Aquinas) thought so, but those who thought so were generally those who thought that the existence of God could be rationally demonstrated, and, for those thinkers, some of their rational demonstrations of God would tend to rely on rational demonstrations of the existence of final causes.

Consequently, we see quite striking differences in the positions of Aquinas, on the one hand, and Ockham, on the other: the former believed both that the existence of God was rationally demonstrable, and that anyone who rejected divine causality would have to reject divine providence (Wippel 2000: 410). Ockham, however, does not believe that the existence of God was rationally demonstrable, and (as we shall see later) his position on teleology was somewhat different from Aquinas's.

The second is that almost all of these authors were very familiar with Aristotle. Now, Aristotle was very influenced by biology: it was, for him, the paradigm science in the same way that physics, or mathematics, is for us. There are many cases in biology where teleological explanation is appropriate: we explain, for example, many features of biological organisms on the basis of their function, and functional explanations are explanations by purposes. Similarly, if we consider the development of different species of animals from their embryos, or of different species of plants from seeds, we have cases where the end-states of a development are radically different, whereas the initial states are indiscernible to the naked eye. So teleological explanations seem quite natural

in these cases, and it is not surprising that, on the basis of these explanations, even physical events tended to have explanations which had a teleological feeling about them. Thus, for Aristotle, heavy bodies fell because their natural place was located downward.

Similarly, the ontological paradigm was quite biological in inspiration: things had natures, and

[a]ccording to Aristotelian metaphysics, natures are complexes of powers. When appropriately coordinated, the collective exercise of such powers converges on an end. In the sublunary world, elemental powers are simple and deterministic. Even where more complex living things are concerned, the “coordination” of their powers is “built-in” in such a fashion that—given relevant circumstances—they function to achieve their end.

(Adams 1996)

And, from such an ontology follows a normative view of events in the world: this coordination could succeed or fail. Even in the case of the motion of bodies, there is a basic distinction between natural and violent motions: in the former, bodies follow their natural inclinations, whereas in the latter they are constrained not to.

There is another, seemingly trivial but nevertheless very decisive, component of this world-view: it is the view that efficient causality happens because of agency. This would not necessarily be *rational* agency, but it would mean that interacting entities could be meaningfully said to have active or passive roles: as Sobol (2001) puts it, “[i]n the Aristotelian world, all change requires that something act and that something be acted upon.” We do not have this view: modern physics gives us plenty of examples of things which “just happen,” not because they have no causes, but because they arise (and maybe even arise deterministically) out of the complex interaction of a multitude of causes which it is impossible to assign active or passive roles to in anything other than an arbitrary way. Similarly, there are, in the medieval view, hard and principled distinctions between the intrinsic and the extrinsic, something which is, again, difficult to maintain in the light of modern physics.

In fact, this normativity, and this assimilation of causality to agency—rather than teleology *per se*—is what is genuinely pervasive in medieval thought. Medieval authors had varying views on final causes, and many of them were just as suspicious of unwarranted teleological explanation as we were. But they all tended to have a very normative view of events in the world, and, likewise, they all tended to attribute active and passive roles to interacting entities.

And, finally, this view of causality makes the theory of causality and the philosophy of mind much more similar in the Middle Ages than they are now. This is not for Kantian reasons—that, for example, causality is a product of our minds—but simply because the way that non-mental things caused stuff to happen was taken to be very similar to the way that minds caused stuff to happen. In fact, Buridan argued that, among natural sciences, psychology was the most certain, because “among other natural things the soul has the most being and is the highest object of cognition” (Zupko 2003: 212).

### ***Form and Matter***

Part of the Aristotelian ontology is the view that objects are composed of form and matter, and that change is to be accounted for by the acquisition of one form and the loss of another. It is, for us, natural to think of form as being like shape or like the configuration of parts, but this would be somewhat foreign to the Aristotelian world-view, according to which continuous substances were infinitely divisible, so that we can (for example) take some water and keep on dividing it: it will still be water, and still have the *form* of water, however small the pieces are. Form and matter should be thought of as explanatory primitives: many (but not all) medievals

thought that form and matter were really distinct, and that, by the power of God, one could imagine there to be matter without form. Duns Scotus believed this (Cross 1998), and so did Ockham (White 1984).

Matter and form, as we have seen, were used to explain change. A further (and logically independent) factor is that, in this sort of explanation, form was generally seen as active and matter as passive. Form thus became an important part of explanations of change and process in the natural world: in the traditional terminology, it was an active principle of change. So form took on a very important explanatory role: as usual, there was a range of possibilities about what that explanatory role amounted to (in modern terms, whether form was supervenient on more basic entities), but it was widely understood to have that role (Boler 1996).

In Aristotle, perhaps because of this explanatory role, form and matter were thought to be causes of things, as well as the other two causes (efficient and final causes). Form and matter were referred to as *intrinsic* causes, efficient and final causes as *extrinsic* causes.

### Texts

We will, then, discuss medieval texts in which causal reasoning plays a part. The texts are by the “usual suspects”—Aquinas, Scotus, and Ockham—and by Nicole Oresme. This is not because they are the only medieval texts featuring causal reasoning, or because they are necessarily the best texts, but because these authors are quite readily available in modern editions and in translation: Aquinas, obviously, but also, as a result of new editions and translations, Scotus and Ockham. We include Oresme because he shows what happened to the medieval causal apparatus toward the end of the Middle Ages.

#### ***Text: Aquinas on Natural and Violent Motions***

As we have said, causal notions in the Middle Ages tended to be quite strongly normed. One of the main normative distinctions was that between natural and violent motions.

There are two ways in which something can be ordained or directed towards something as if to an end: (1) by itself, like a man who directs himself to the place where he is going; and (2) by something else, as an arrow is aimed at a definite spot by the archer. Nothing can direct itself to an end unless it knows the end; for the one directing must have knowledge of that to which he directs. But even things which do not know the end can be directed to a definite end, as is evident from the arrow.

This can come about in two ways. (1) Sometimes what is directed to an end is merely driven or moved by the one directing it without acquiring from the director any form by which such a direction or inclination belongs to it. Such an inclination, like that by which the arrow is aimed by the archer at a definite target, is violent. (2) Sometimes what is directed or inclined to an end acquires from the director or mover some form by which such an inclination belongs to it. In that case the inclination would be natural, having a natural principle. Thus He who gave heaviness to a stone inclined it to be borne downwards naturally. In this way the one who begets them is the mover in regard to heavy and light objects, according to the Philosopher in *Physics* VIII (4, 225b35–256a2).

It is after this fashion that all natural things are inclined towards that which is suitable for them, having in themselves some principle of their inclination by virtue of which their inclination is natural, so that in a way they go themselves and are not merely led to their due

ends. Things moved by violence are only led, because they contribute nothing to the mover. But natural things go to their ends inasmuch as they cooperate with the one inclining and directing them through a principle implanted in them

(Aquinas 1954: XXII.1, vol. III, p. 36).

Notice here that the genuinely *teleological* elements are quite moderate: nothing can genuinely direct itself to an end by natural powers unless it is sentient and *knows* the end. But the ruling concept here is being *ordered* to an end, which has very wide application. Furthermore, the distinction between natural and violent motions is defined by whether the principle of movement is intrinsic or extrinsic. We would, of course, interpret such a distinction to differentiate biological from non-biological cases: but for Aquinas there are plenty of cases of non-biological natural motions—i.e. those with an intrinsic principle of movement—of which the tendency of heavy bodies to fall is paradigmatic. And this doctrine is explicitly normative: things are naturally inclined toward “that which is suitable for them.” Thus, we get out of this a notion of natural place: the natural place for earth, for example, is at the center of the world, which is why most of the earth in the universe ends up there.

It is probably this distinction between natural and violent motions, and with it the remarkably normative account of change, together with concomitant ideas like natural place, that distinguish medieval from contemporary thought about teleology. In fact, even those parts of medieval causal thought which were quite strikingly anti-Aristotelean—for example, the medieval impetus theorists—still keep the apparatus of natural and violent motions (White 2013).

### ***Text: Scotus on the Interdependence of Causal Relations***

Scotus’s *Treatise on God as First Principle* is a work on natural theology, and specifically on the metaphysical priority of God vis-a-vis the world. This treatise is itself a summary of parts of a very large and intricate proof of the existence of God; it stands on its own, but it was developed as a component of a much larger structure.

In the treatise, Scotus analyzes relations of priority, and, as part of this analysis, he describes the relations between efficient and final causality. Consequently, he gives answers to some of the questions that contemporary philosophers will naturally want to ask, such as those about the reducibility of final to efficient causality. However, the answers he gives are likely to strike modern readers as rather strange, for several reasons.

The first is that, in this treatise (and in general: he wrote one of the great commentaries on Aristotle’s *Metaphysics*), he was interested in the large-scale causal architecture of the universe. He does, it is true, touch on Aristotle’s treatment of how we humans can cause actions which we do not intend as side-effects of actions which we do intend, but he does not go into it very deeply. Rather, his interest lies in what happens when we follow chains of efficient causality as far back as we can, and what happens when we follow chains of final causality as far forward as we can. If we do this, he argues, we will in either case arrive at one of the significant metaphysical constituents of reality.

The second is that he regarded Aristotle—and the tradition of philosophy which had come down from him—as the paradigm example of what unaided human reason could attain. The work of the philosophical tradition was so good that one could argue negatively from it: if there were no philosophical proofs extant of some particular assertion, then this assertion must be impossible to prove (1975: 176, Q. 7.57). This, of course, amounts to a very optimistic assessment of the power of unaided human reason. Nevertheless, Scotus did think that the philosophical tradition was wrong: specifically, it was wrong about God’s power to cause things. The Aristotelian position was that there is an entity called the prime mover which attracts the celestial spheres and causes them to

move (this is an instance of final causality), and that the celestial spheres cause all other objects to move (these are instances of efficient causality, and, in fact, the first members of all other chains of efficient causality). Consequently, according to Aristotle, chains of efficient causality and chains of final causality do not terminate with the same entities (Falcon 2006; Bodnar 2012).

Thus, if we ask whether God can cause everything *directly*, we would get two different answers depending on whether one asked a philosopher or a theologian. For a philosopher, God would be the Aristotelian prime mover, and would (by final causality) cause the celestial spheres to move directly, and would cause everything else indirectly, via the efficient causality of the spheres (Scotus 1975: 172f, Q. 7.43); for a theologian, God would be able to cause everything by efficient causality. In fact, God's creation of the world was taken to be an instance of efficient causality (ibid.: Q. 7.52). We should notice that, when Scotus talks in this treatise of final causality, he seems to have in mind either God or the Aristotelian prime mover, who are both the ultimate end of things in the world in the sense that, if one follows the chain of final causality, one ultimately gets to God or the prime mover. The Christian God (but not the Aristotelian prime mover) is also the first efficient cause of everything else. The treatise is, to a large extent, carefully neutral on these questions: the arguments work in either case.

Scotus sets his position out in a number of "conclusions." The ones we will be interested in are concerned with the relation between final and efficient causality. Since this is a work in natural theology, these conclusions are, in fact, about God: from this point of view, God is not ordered to an end, and neither is God an effect of anything. So the two conclusions state that these two properties (not being ordered to an end and not being an effect) are equivalent.

(Fourth Conclusion) What is not ordered to an end is not an effect.

The first proof is this. There is no effect which does not stem from some proper efficient cause; if something is not ordered to an end, it does not originate from a proper efficient cause; therefore, etc. The major is proved as follows. In no type [of causality] is the incidental first. Aristotle adequately expresses this in the second book of the *Physics* where he says that intelligence and nature as proper causes are necessarily prior to the incidental causes of spontaneity and chance. But what does not depend on what comes first does not depend on what is posterior (from the third conclusion above) . . . The minor is proved thus: every proper agent acts for the sake of an end, for it does nothing in vain.

(1966: 16)

The terminology of "proper cause" comes from Aristotle, who distinguishes between incidental causes (spontaneity and chance) and proper causes (nature and intelligence). Intelligence and nature are the efficient causes which act for the sake of an end: chance and fortune do not. Scotus takes it from Aristotle that incidental causes can be reduced to proper causes (Scotus 1966: 177), in such a way that, if our entity *X* (which has no final cause) had an efficient cause, then it would have a *proper* efficient cause. So, if our entity which cannot be ordered to an end had an efficient cause, it would have a proper efficient cause: but this efficient cause would then cause *X* for the sake of some end *Y*. But this would mean that *X* was ordered to an end, and we have a contradiction. Consequently, *X* has no efficient cause at all.

The crucial step in this argument is the assertion that, if something has no proper efficient cause, it has no efficient cause at all. We can usefully compare the aforementioned passage with the parallel passage in Scotus's large commentary on the *Sentences* (the *Ordinatio*). Its version of the first step reads as follows:

This . . . consequence is proved from the fact that every proper agent acts for the sake of an end as is said in [Aristotle], *Physics* II [c. 5, 196b17–22] . . . Now a thing cannot be produced

if no proper efficient cause of it exists, for the first of any kind of cause is never an incidental cause. This is clear from what is said of incidental causes, which are chance and fortune. These, according to Aristotle in *Physics* II [c. 6, 198a5–13] must be reduced respectively to the prior causes of nature and intellect as purpose, neither of which are incidental causes. Hence, whatever has no *per se* efficient cause has no efficient cause whatever.

(1950: 166, Ord. I, dist. 2, pars 1, qq. 1–2, translated in 1987: 47)

So here we have a description of the types of incidental cause (chance and fortune), and the assertion that there are always proper causes in those cases. To a modern eye, the details of this are still not clear: and, although we find plenty of assertions in medieval philosophy that incidental causality can always be reduced to proper causality, this tends to be explained by a relatively small number of stock examples. These arguments seem, from a modern viewpoint, to be quite weak: one of the decisive factors here is that modern physics gives many examples of incidental causality which cannot, in any simple way, be reduced to proper causality.

But there is also a more general question here: in the earlier passage in the *Treatise*, there is the statement that “in no type [of causality] is the incidental first.” What does this mean? Specifically, what does “type” (*genus* in Latin) mean? And what ordering does “first” refer to? As for the type of causality, this most probably refers to the fourfold division of causes. This would, in turn, mean that “first” cannot solely refer to temporal ordering. And, in fact, there is a relation of priority which is very important to Scotus’s metaphysics: that is priority by nature. As Normore says, “priority of nature is central to Scotus’s metaphysics” (1996: 167). And, in fact, we have a metaphysics (connected to a doctrine of how the creation of the world happened) according to which there is a priority in the constitution of the world, corresponding to a priority in God’s creative activity: this creative activity is divided into stages, called “instants of nature,” all of which happen at the same time but which have a logical ordering between them (Normore 2003). It is on this that the priority of nature is based: and, consequently, Scotus is saying here that proper causality is prior, by nature, to incidental causality. So the ordering to which he appeals is a modal notion, and the modality has to do with which entities are necessary for the existence of which other entities: it is a modality which, as Normore says, is “not semantic but metaphysical” (1996: 161).

We should, incidentally, notice that the idea of instants of nature was encouraged, or at least made technically possible, by a particular practice of disputation: to be precise, a particular sort of disputation called *obligations* (Spade 1982; Stump 1982; Normore 1996: 171).

The argument for the opposite dependency goes like this:

(Fifth Conclusion) What is not an effect is not ordered to an end.

The proof consists in this: that the end is a cause only to the extent that the existence of what is ordered to an end depends on this end as upon something essentially prior. This is clear since every cause *qua* cause is prior in this way. However the thing ordered to an end cannot depend for its being on the end, and in this way on something prior, unless—insofar as it is an end, and because it is loved—it moves the efficient cause to give it being, in the same way that the efficient cause would not bring something about in its genus [of causality] unless there were some end at work in its own [genus of] causality. Hence only what the efficient cause brings into existence for love of the end is caused by the end.

(1966: 18, translation slightly altered; see the parallel passage in 1950: 162f, Ord. I, dist. 2, pars 1 qq. 1–2, translated in 1987: 45)

The beginning of the argument is relatively uncontentious: causes are prior by nature to effects, and this is so even if we are talking of final causality. This is, says Scotus, true of “every cause



*qua* cause”; thus, up to now, we have Scotus’s idea of priority by nature. But then, says Scotus, the thing ordered to an end can only depend for its being on the end if it is *efficiently* caused by something, and this efficient cause must be moved by the end. So we have the Aristotelian world picture here (with a reminder of Conclusion 4 in the passage beginning “in the same way that the efficient cause . . .”).

### ***Text: Scotus on Causality in the World***

One possible response to the aforementioned arguments, especially the second one, is to say that, surely, this chapter is the final cause of my writing actions now, but the chapter does not exist right now, so the final cause surely cannot be prior to what it causes. When Scotus is not constructing arguments in natural theology—for example, in his commentary on the *Metaphysics*—Scotus holds that, for example, “[the end] is first according to the being it has in the mind of the agent, and last according to the being it has in matter” (1997: 349, Book V, q. 1, §29), which seems to fit the human creation of artifacts much better. So this adds a nuance to the discussion of the previous section: final causes are, in an appropriate sense, always prior by nature, but while with creation the final cause is God, with the production of artifacts in the world, the final cause is the idea of the artifact in the mind of its maker.

And it is in this sense that everything acts for an end:

Every agent *per se* (I add “*per se*” to exclude chance and fortune) acts for the sake of an end, according to the Philosopher in *Physics* II [196b17–19], where he divides an agent that acts for the sake of an end into [a] an agent that acts by nature, and [b] an agent that acts by the intellect. Chance occurs in an effect of a natural cause, but fortune befalls an agent that acts for a purpose. According to what is said in that same book [*Physics* II 198b10–11], nature acts for an end, and, according to *De Generatione* [in fact *Metaphysics* II 994b13–14] intellect similarly.

And there is one argument that holds for both: that every agent in whose action error can occur, acts for an end, but every *per se* agent is of this sort. In nature monstrosities occur, and in the intellect false judgements and habits.

Also, as one gleans from Bk. II of the *Physics* [994b13–14], that action which cannot attain the intended end is said to be in vain; but if no end were intended, no agent would act in vain; it is necessary, therefore, to assume an intended end.

Nor would the argument [have to be] about [actual] error. Therefore, if every *per se* agent could err, every agent then would act for an end. Such is a natural agent which can err. At times this is also true of one which acts through the intellect.

(1997: 398, Book V, Q. 1)

We are here quite definitely outside the area of natural theology, as the discussion of error makes clear. Nature is thought of along biological lines: it can produce “monstrosities” (i.e. imperfect individuals), and this possibility aligns it with the intentional actions of humans and others. The possibility of mistakes in both cases reveals the teleology at work. Here, we have an area of Duns Scotus’s work which is decidedly naturalistic, although not in a modern sense: agency is pervasive in both the human world and the natural world, and the concept of agency here is strongly normative. Actions, whether natural or human, can all, it seems, succeed or fail.

We see the same set of concerns—namely, of asking about purpose and teleology, and of comparing intentional and natural agency—also come to the fore in Scotus’s very nuanced discussion, in his commentary on the *Metaphysics*, of whether animals are capable of prudence (1997: 75ff, Book I, Q. 3). Here, the problem is that Aristotle says in *Metaphysics* I (980a25–b5) that animals are capable of prudence. But this raises a problem, because according to many medievals, prudence

was a rational capacity, and animals did not have reason. So Scotus argues that “prudence exists in brutes only metaphorically, and has to do with the things which are sought or avoided by natural instinct” (ibid.: 76). But there are further problems to be resolved, because some animals seem to act in a way that looks very like an exercise of prudence: as Scotus puts it:

many animals accomplish things by knowing in the same way that things are done by a reasoning man on the basis of his knowledge.

(*Ibid.*)

To this, Scotus responds:

To this it must be said that, although there is a certain similarity in the way that both man and animal act, nevertheless, this does not mean that their knowledge is similar, for a man acts from deliberation; and that which he elicits after deliberating could also be arrived at without deliberation and from the sense appetite alone. And while the exterior acts of both resemble each other, both would not be masters of their actions in the same way.

(*Ibid.*)

So we have here something very like Sellars’s distinction between the realm of nature and the realm of law (Sellars 1956): there are causal explanations for both animal and human actions, but humans (and, of course, other rational agents) are capable of deliberation, which makes them masters of their actions in a way in which animals are not. However, despite this similarity, there are profound differences: both sides of the divide admit normative criteria on the outcome of actions, which is very unlike Sellars’s picture. Furthermore, there is, in Scotus (Buridan’s position may be different on this issue—see Biard 2001), no tendency to align the human/animal divide with that between necessity and contingency. As Scotus says:

in us, prudence is a deliberative habit, not about the end aimed at, but about the means or ways of getting there, and it concerns not what has to be done of necessity, but with what can be done contingently. And so also in animals, it concerns something which could be otherwise, for instance, that [grain] could be gathered in this place or that, or from this heap or that . . . Or the spider builds its web in a place where there is a greater abundance of flies, or the swallow constructs its nest where it is more difficult to get to.

(1997: 76)

So, even though the motivation for the distinction between the human and the animal realm may be very similar in Scotus and in Sellars, the general picture is remarkably different: Scotus is working in an era which, unlike ours, does not have the idea of a causally closed, norm-free, realm of natural science. Norms are pervasive for Scotus: proper causes are prior by nature to incidental causes, and this introduces a normative dimension into the causal realm, and the distinction between normal and monstrous products of natural activities introduces a further normative dimension into natural productions.

### ***Text: Ockham on Chance and Fortune***

Ockham describes here what are called chance and fortune in the Middle Ages: as appears from Ockham’s distinction, these are basically unintended consequences. We should notice that these concepts are not what we would call chance and fortune (that is, genuine randomness or indeterminacy): there is a great deal of argument on indeterminacy in the Middle Ages, but it mostly

occurs in discussions of the semantics of future contingent propositions. However, the discussions of chance and fortune are interesting in their own right, since they cover what we would think of as the intentionality of agency.

One should note first that chance and fortune are agent causes. [This is so] because this appears from the way that the Philosopher proceeds, where he says that something happens by chance which happens beyond the intention of the agent in some way: and if such a thing is done intentionally by an agent, then it happens by fortune. And thus, since it is up to the agent to intend something and not something else, only an agent cause will be the cause of chance or fortuitous effects, so that there should be chance or fortune. However, a final cause is not said to be chance or fortune, because without it the effect will still take place. So, if someone goes to the marketplace to buy necessities, if, without intending to, he finds someone who owes him, that discovery is said to be by fortune. The cause of it is him going on his way to buy necessities, and, although this is the end intended by him, it is not the cause of that effect, namely finding the debtor; because if, when he went, he intended another end and not that, the discovery would nevertheless happen because there would be no change in anything but the end that he had in mind. And so the agent is the cause of that effect and not the end.

Two things follow from this. One is that that cause which is fortune is not asserted indeterminately or infinitely because there can be innumerable agent causes—for otherwise such an effect could not come about other than by a single agent—but because [the agent] can intend innumerable ends, of which none would be the cause of that effect which is [brought about] by fortune by that agent. And thus although fortune is said to be infinite and indeterminate only because of the innumerable ends [which can bring it about], however fortune is not a final cause nor can be reduced to that [kind of] cause, because none of them is the cause of that effect.

Another thing follows from the preceding: that there are effects which have no final cause, just as there are effects which at some time are not intended by any agent. For example, if someone went near to a wall, not intending that his head should be broken, if then a stone fell on his head and broke it, that fracture would be intended by no agent: this is because it is not [intended] by the stone, nor by the mover of the stone, nor of the person who went. And so it is an effect which lacks a final cause.

(1985: 344f, *Book II, c. 10, §3*)

### ***Text: Ockham on Habits***

Just as does Scotus, Ockham also has a pervasive metaphysics which influences almost all of his causal reasoning. He has a discussion of whether it is necessary to posit habits (1991: 234ff, *Quod. 3, q. 20*), which is typical of a great deal of his argumentation about causality in the natural world. The issue here is whether it is necessary, in order to account for the behavior of things in the world, to posit mental entities called habits. Now it is true that, in the texts which Ockham took to be authoritative (Aristotle, for example), there is a great deal of talk about habits. When Ockham (or whoever asked this question) does not want to deny that these texts are authoritative: rather, the question is about the *semantics* of these texts. Are there distinct things, habits, corresponding to the word “habit” in the text? Or can we apply some sort of eliminativist strategy?

Habits, in the Aristotelian literature, are mental entities which are generated by repeated acts of perception, repeated bodily acts, and so on. Such habits make the acts which cause them easier, or maybe even make them happen automatically: thus, they play a very similar role in mental causation, and they are located in the same mental faculties, or parts of the body, as the acts which cause them.

Ockham cites an argument against the existence of habits which goes:

Everything can be accounted for without habits. For when the object is present, acts can be elicited without habits. Therefore, there is no need to posit habits.

(1991: 234)

This may seem to be a typical application of Ockham's so-called razor—that "it is futile to do with more what could be done with fewer" (Adams 1987: 156)—but in this case Ockham does not take the eliminativist option:

I claim, first, that it is necessary to posit habits in the body. This is evident from the fact that after many acts have been elicited, the body's executive power is able to elicit exactly similar acts, acts that it was not previously able to elicit or at least not previously able to elicit so easily—as is clear in the case of scribes, weavers and other artisans. Therefore, in those executive powers either something is added or something is taken away. And it does not appear that anything is taken away. Therefore, something is added, and this I call a habit.

(1991: 234)

This argument depends on a particular ontology: the world is a collection of individuals, and, if there is a change, there must be more, or fewer individuals. In this case, there will be such things in the body, and practicing a physical skill will give you a new one.

But as well as habits in the body, we can think of habits in our mental faculties: Ockham considers the sentient appetite (the seat of bodily desires), the sentient apprehensive power (imagination, etc.), the intellect, and the will. Ockham says that we cannot prove that there are habits in the sentient appetite, because

all the things we experience to be in us after a large number of acts of the sentient appetite are such that we can sometimes experience them to be in us after some change in the body without a large number of acts of the sentient appetite.

(1991: 234)

As he explains elsewhere, he is talking of the way in which medicines, for example, can reduce (or, presumably, increase) bodily appetites, and also of the way in which habitual overeating can cause manifest bodily changes which accompany the increased appetite which overeating can bring on (1991: 154). Here, although there are certainly *changes* (and hence extra entities), they may well be bodily changes, thus not changes in the sentient appetite, which is part of the mind: consequently, they will not be habits.

However, there must be habits in the sentient apprehensive power, for this is how imagination behaves:

[A]fter a large number of acts of imagining, one comes to be inclined towards exactly similar acts, and one is in no way inclined to such acts before all the acts of imagining.

(1991: 235)

But there is a possible objection:

You might object that sometimes the imagination erupts into acts of imagining and acts of speaking without any similar previous acts. This is evident in the case of madmen and

lunatics, who have many acts of imagining and say many things that they never previously imagined when they were sane. Likewise, those who are asleep dream of many things that they had not previously imagined.

(*Ibid.*)

to which Ockham replies that it is a matter of how the outputs of these habits are arranged:

I reply that in such people there are many acts ordered in different ways. For such acts are ordered differently in health and in sickness, and they are ordered differently in one who is awake and in one who is asleep. But each of these acts [in sickness and in sleep] presupposes an act similar to itself in health and in the waking state. And it is in this way that one who is asleep seems to formulate propositions and syllogisms. For while awake, he has heard propositions and syllogisms and parts thereof, and then he imagines things that he heard as a child, and because of a different bodily condition he imagines such acts or sounds in a different order.

(*Ibid.*)

Ockham now seems to be talking of some sort of syntactic relations between habits, or between the things they produce: this can produce new results by combining parts which are, individually, similar to mental phenomena which have been produced before. These syntactic relations are not objects, but the fact that they hold of these objects is an objective fact about the world: it is a position strangely reminiscent of logical atomism (White 1990).

It is, incidentally, not clear that the acquisition of bodily skills does not require a similar explanation: we can, that is, learn adaptive skills which lead us, in a context-dependent way, to produce new bodily movements, or we can learn skills—dancing, for example—which consist precisely in the performance of syntactically structured series of bodily movements. However, there is a certain intellectualism about the philosophy of this period which would not encourage the consideration of complexly structured bodily acts of this sort.

### ***Epilogue: Nicole Oresme***

Nicole Oresme was a fourteenth-century theologian who wrote extensively on the natural world. He translated Aristotle's *On the Heavens* into French, expanding it with a good deal of commentary: in his commentary on Book I, he considers Aristotle's arguments that there can be only one world (276b14ff). One of these arguments uses the idea of natural place which we saw in the text from Aquinas: if there were another world than this one, then the heavy constituents of the other world would have the same natural place as those of this one, namely the center of *this* world, so they would naturally move there, which is absurd. Oresme dismisses this argument:

in this world a part of the earth does not tend towards one center and another part toward another center, but all heavy bodies in this world tend to be united in one mass such that the center of the weight, and all of the parts constitute one body . . . Therefore, they all have one single place. And if some part of the earth in the other world were in this world, it would tend toward the center of this world and be united with the mass, and conversely. But it does not have to follow that the portions of earth or of the heavy bodies of the other world, if it existed, would tend to the center of this world because in their world they would form a single mass possessed of a single place and would be arranged in up and down order . . . just like the mass of heavy bodies in this world.

(1968: 175)

We should note, however, that all Oresme is trying to establish is the *possibility* of other worlds than this one. He states quite firmly that there is, in fact, only one world:

I conclude that God can and could in His omnipotence make another world besides this one or several like or unlike it. Nor will Aristotle or anyone else be able to prove completely the contrary. But, of course, there never has been nor will there be more than one corporeal world.

(1968: 177ff)

In this respect, he was thoroughly medieval: he is investigating logical possibilities, and he thinks that Aristotle has erroneously concluded that a certain position (namely that there is only one world), although it is true, cannot be proven by reason alone. And Oresme still uses the concept of natural place, and with it the concepts of natural and violent motions.

However, as we see from the aforementioned citation, the concept of natural place has become somewhat relational: if earth from the other world were moved to this one, its natural place would become the center of *this* world. So the natural place of something is at least partly determined by the surrounding matter. And there are further adjustments to notions like up and down, large and small, which also become somewhat relativistic. So, although we still have a concept of natural place here, it is not the same as Aquinas's concept: things have moved considerably, albeit still within a fundamentally medieval world-view. These conceptual developments have led to many late medieval thinkers, and Oresme in particular, being labeled as "precursors of Galileo" (White 2013).

## Conclusions

We have seen that, despite a number of common themes, there is a great deal of variety in the treatment of causality in medieval authors: in ontology, in the normative constraints applied to causal explanations, and in the role of causal explanations in philosophical explanation (whether, for example, a piece of causal reasoning formed part of a proof of the existence of God or whether it was simply an investigation of part of the natural world without, seemingly, any ulterior theological connection). One of the striking phenomena in the texts that we have examined is the normative character of a great deal of these causal explanations: despite a great deal of analysis of these causal arguments in the current literature, this normative character seems to have been very little remarked on. This is made even stranger when contrasted with the revival of interest in normative questions in a great deal of contemporary philosophy, both analytical and non-analytical. There may well be something worth investigating here.

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