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ARISTOTELIAN FORMS AND LAWS OF NATURE

Abstract

Aristotelian Forms are mysterious entities. I offer an account of them as entities that make the laws of nature be laws. The Aristotelian ontology is fundamentally an anti-Humean ontology: Not only are laws a reality over and beyond regularities, but that in virtue of which they are laws is in fact that which is most truly called substance. If we further take it, say, on ethical grounds, that there are individual forms, then we get a multiplicity of substances in the universe, including multiple substances of the same sort, and the laws of nature end up being grounded in their powers. But we have global regularities, then, only because there is coordination between the lawmakers, or forms, of the solo doings of individual entities, a coordination that entails global patterns.

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I. Introduction

We may have a bit of a handle on roughly what kinds of entities the Platonic Forms are. We can think of them as analogous to a number of notions in contemporary philosophy that are denominated “Platonic abstracta,” e.g., propositions, concepts, mathematical and the like. We may think them queer, but we have some idea what their queerness consists in. We may even believe that some of these kinds of entities actually exist.

But what are Aristotelian forms? We know they are not like the Platonic ones. For instance, Aristotle insists that the great fault of Platonic forms is that they are not causes and so are of no explanatory use. Indeed, likewise, our contemporary Platonic abstracta fail to be causes. We take it for granted that it would be a category mistake to talk of a proposition or a mathematical object causing something to happen—that is, indeed, why it is so puzzling how one can *know* abstracta. But Aristotelian forms are causes. For one, they are the primary entities in Aristotelian ontology and if Aristotle is to escape his own attack on Platonism, they thus had better be causes. For another, Aristotle explicitly says that they are in *Metaphysics* Z.17. What kind of a queer entity is the form of the human being if this form actually can cause things to happen, while still being the principle of intelligibility of human beings apparently like a Platonic Form and like what we might denominate “the concept *humanity*”?

There are plenty of things we can say *about* Aristotelian forms. They are causes. They are principles of intelligibility. They are in some way the primary things in existence. They are somehow primary *this-somethings* or *this-suches* (depending on the interpreter). And there are controversial questions we can ask about Aristotelian forms. Are there forms of the four elements? Is there one form for all human beings, or does each have her own particular form? Are the divine substances forms? But even if we answered these controversial questions, we still would not know *what* the Aristotelian forms are. The challenge, then, is to explain, with the help of ontologies that we think we have some grasp of, what Aristotelian forms are. This paper is an attempt at an answer to this expository challenge.

In this attempt, I will have to make some exegetical choices. I shall not try to justify them specifically, but rather will hope that the fact that the account as a whole makes Aristotelian forms intelligible will provide some justification for these choices. In the end, I will be satisfied if the account is

interesting metaphysically, even if it turns out not to be exactly what Aristotle intended. The account of forms as analogous to lawmakers that I shall give is inspired by an “analytic Thomist” account of substantial forms that John Haldane has given at a colloquium at the Center for Philosophy of Science (Pittsburgh). Thus, much of what I say about Aristotle will apply to Aquinas.

This is a project in rational reconstruction of Aristotelian thought, showing how one might attempt to characterize forms understood along Aristotelian lines in terms of truthmakers and laws of nature.

But now a digression is needed, as it will turn out that our explication of forms requires us first to give a general account of some non-Humean theories of laws of nature.

II. Laws of nature and lawmakers

The most basic dichotomy between views of laws of nature is that between Humean views, on which the laws of nature are merely descriptions of the actual states of affairs that obtain, and anti-Humean views, according to which the laws of nature have modal import and describe something over and beyond correlations between actual states of affairs. The best argument against the Humean approach may well be the very one that Aristotle levies against Platonic Forms: Humean laws of nature do not have any causal power and fail to explain anything. That all ravens are black is only explanatorily relevant to the claim that my raven, Smitty, is black if its force goes beyond the mere description of the color of the ravens in existence. If it is a mere coincidence that all ravens are black, then this accidental generalization fails to explain Smitty’s blackness. Indeed, explaining the blackness of Smitty by the blackness of all ravens when the latter is a mere coincidence is explaining the obscure by the more obscure: The coincidence of all ravens being black is more surprising and calls out for explanation more than Smitty’s happening to be black.

Our best modern Humean accounts of laws are best systems accounts like that of David Lewis.¹ Roughly,² to be a law is to be entailed by that system

¹ D. Lewis (1983), “New Work for a Theory of Universals”. *Australasian Journal of Philosophy* 61: 343–377.

² There are further complications in the case of indeterministic laws.

of true propositions which best optimizes a combination of two desiderata, (a) informativeness and (b) simplicity, and to be a fundamental law is to be a proposition (or axiom) of that best system. Informativeness is a measure of how much detail about the universe the propositions in the system entail. Simplicity can be measured, say, by brevity of expression in a language all of whose terms correspond to perfectly natural concepts. Suppose, then, that it is a fundamental law that all ravens are black.³ A part of what makes the proposition, p , that all ravens are black a law on the best systems account is that p is a true proposition, since it is only true propositions that are allowed to be in the system. But surely a part of what makes it true that all ravens are black is precisely that Smitty the raven is black. Thus, that Smitty is black partly explains why it is a law that all ravens are black. It is implausible, then, that the law should explain why Smitty is black.

Let us then part company with the Humeans on the laws of nature. There is more to something's being a law of nature than its being true of the actual universe. We must, of course, be careful here. Suppose it is indeed a law of nature that all ravens are black. It is reasonable to say then that the law of nature is a proposition, namely the proposition that all ravens are black. But then, it seems, we are no further ahead than the Humean, because *qua* proposition, it asserts nothing more than that all ravens happen to be black. However, while the proposition B that all ravens are black merely predicates blackness of the actually existent ravens, the *further* proposition that B is a law of nature says something more than just that B is true.

We can characterize dissent from a Humean position by saying that there is more to a proposition p 's being a law of nature than p 's being true, p 's having certain formal features (like being universally quantified and perhaps involving non-gerrymandered concepts) and/or p 's fitting into some optimal account of the world's *actual* occurrences (as on David Lewis's story about laws). In particular, there might well be propositions p which are laws of nature in some possible worlds (and they may even fit into a best account of the events there), and yet which are not laws of nature in all possible worlds in which they are true.⁴ For instance, in our world, that objects fall

³ Presumably, it is not, but the example is more convenient than statements about fundamental particles, say.

⁴ This is not true of *all* laws of nature. For instance, some laws of nature might be necessary truths if they predicate essential properties of their objects. Also, arguably,

when dropped is a law of nature; however, one can imagine a world where the laws of nature do not at all constrain the movement of massive falling objects, but where the massive objects indeterministically *happen* to move just as they do in our world.

Now, plausibly, every true proposition is true in virtue of its accurately reflecting some aspect of reality. That aspect of reality is the proposition's "truthmaker." The truthmaker of the proposition that all ravens are black is the blackness of all actual ravens. The truthmaker of the proposition that Socrates exists is Socrates himself. The truthmaker of the proposition that Socrates is sitting is Socrates' (act or passion of) sitting. Now, if p is a purely categorical proposition that is a law of nature, then we can ask not just what the truthmaker of p is, but also what is the truthmaker of the further proposition *that p is a law of nature*. This truthmaker must be some aspect of reality. It must thus exist, since the nonexistent cannot be a truthmaker by Parmenides' principle. We need a name for the truthmaker of a true proposition of the form *that p is a law of nature*. The name should not be an abstract noun, because this truthmaker is not an abstract entity or concept, but an actual aspect of our existent universe, having explanatory prowess. I shall call such a truthmaker a "lawmaker" of p , that which makes the true proposition p into a law. Of course, just as the "truthmaker" of a proposition need not be a person that makes the proposition true (except in special cases: the truthmaker of "Socrates exists" is a person, namely Socrates), so too one should not read personhood into the term "lawmaker."⁵

Of course, there have been challenges to the Parmenidean claim that true propositions require existent truthmakers, with the most powerful ones focusing on negative existential propositions, or equivalently universal

the proposition that p is a law of nature is itself a law of nature if and only if p is a law of nature, so that the proposition that affirms nomicity of the proposition that all ravens are black is a proposition that is a law of nature in every possible world in which it is true.

⁵ On certain views of laws of nature, some or all lawmakers will turn out to be persons or aspects of persons. For instance, a theist like Richard Swinburne will say that a proposition's being a law of nature is constituted by God's directly willing it to be such, so that the lawmaker of the proposition is the will of God. Or if one thinks that ultimately all natural lawfulness supervenes on dispositional properties of substances, and if persons are substances, then the dispositional properties of persons will be lawmakers, though there will also be lawmakers which are the dispositional properties of substances that are not persons.

propositions. What makes it true that there are no unicorns? It would seem to trivialize the truthmaker theory to claim that there exists the state of affairs of *there not existing unicorns*. One might, following a suggestion of Richard Gale,⁶ instead posit a conjunctive state of affairs of everything's being either A_1 , A_2 , or ... (the list being finite or infinite) and A_1 's having some positive property P_1 incompatible with unicornicity, A_2 's having some positive property P_2 incompatible with unicornicity, and so on.

Alternately, one might, perhaps inspired by Aristotle's famous statement that speaking truly is saying "of what is that it is or of what is not that it is not,"⁷ allow that there are two basic kinds of propositions. There are positive propositions, which are made true by something that exists, and there are negative ones, which are made true by the non-existence of something whose existence would have made them false. In other words, a basic proposition is either made true by a truthmaker or by the absence of a falsemaker.⁸ Of course, there are technical difficulties in distinguishing positive from negative propositions, and the view must be extended to more complicated combinations of positive and negative propositions.

I will ignore the truthmaker-falsemaker view, because it seems *prima facie* unlikely that explanatory laws are at base constituted as such primarily by the *lack* of something. It is something positive that we are looking for when we seek the ground of laws. At the same time, because a *lack* might enter into an explanation (the rock fell because of the force of gravity and because *nothing counteracted this force*), so we may need to allow that in addition to the lawmaker of a law, for the law to be such there may need to be some sort of a lack as well. But it is the lawmaker, which in this case will consist of the positive aspects of reality reported by the proposition that p is an explanatory law, that I will focus on.

Now, it is a truism that laws of nature are not causes. This is because they are mere propositions. However, there are contexts in which one wants to use causal language about laws of nature. One may wish to say: "The law of gravitation made this apple fall." Yet, since the law of gravitation is a mere proposition, it cannot make anything fall. But what *does* make apples fall,

⁶ R. M. Gale (1976), *Negation and Non-being*. American Philosophical Quarterly Monograph, no. 10.

⁷ *Metaphysics* Γ, 1011b27.

⁸ Cf. D. Lewis (2001), "Truthmaking and Difference-Making." *Noûs* 35: 602–615.

given appropriate initial conditions, is the lawmaker of the proposition that the law of gravitation holds. For, the explanatory relation between (a) the proposition that $F=Gm_1m_2/r^2$ (the formula, of course, abbreviates a more complicated statement which gives the definitions of all the symbols), (b) the proposition reporting the initial conditions and (c) the proposition reporting the fall of an apple mirrors an objective, ternary relation in nature between the lawmaker of the proposition that $F=Gm_1m_2/r^2$, the dropping of the apple and the falling of the apple. If the explanatory relation between a law-reporting proposition, an initial fact-reporting proposition and a final fact-reporting proposition failed to mirror some kind of extra-mental relation in nature between the lawmaker and truthmakers of the respective propositions, then explanatory relations would lack objectivity. But the search for explanations is a search for objective truths. Given that, generally speaking, we are willing to say that a relation of *causality* between events *A* and *B* is parallel to a relation of *explanation* between the propositions reporting that *A* and that *B* happened, the relation between the lawmaker of the law of gravitation, the initial conditions and the fall of the apple is one that we can also call “causal” in an extended sense. Thus, nomological explanatory relations can be said to be parallel to causal relations between lawmakers and truthmakers.

So the laws of nature are not causes, but their lawmakers can be meaningfully said to have causal efficacy or causal relevance. And there must *be* such lawmakers if the laws of nature are not to be Humean, and every true positive proposition must have a truthmaker while the claim that something is a law is a positive proposition. What I have said so far is, however, neutral between various concrete anti-Humean accounts of laws of nature. Indeed, these accounts can be seen as nothing else than different substantive accounts of what the lawmakers are, with differing levels of ontological commitment to these lawmakers. If one thinks that the laws of nature can be reduced ontologically to the dispositional properties of substances, then the lawmakers will ultimately be nothing but instances of these dispositional properties. If one thinks that a theory of physics is true on which ultimately it is spacetime that moves particles around, then spacetime or its properties will be the lawmaker or lawmakers. If one thinks that the idea of a law of nature is primitive, then there will be no reductive account of a lawmaker beyond saying that it is “the truthmaker of a proposition reporting that some other proposition is a law of nature.” If one thinks that what makes something a law is that it has natural necessity, then the lawmaker

is some state of affairs of there being a natural necessity or some universals or essences, or at least relations between universals or between essences,⁹ or perhaps it is some fact about the world as a whole.¹⁰

There is a further step that may be taken. One may insist that the relation between the lawmaker and the initial conditions, on the one hand, and the events reported in the explanandum, on the other hand, is *literally* causal, and not just causal in some extended sense. If one takes this further step, one departs from many non-Humean accounts. But this step has a significant explanatory advantage. A scientific explanation of an event will include a statement that such-and-such is a law of nature. This statement is a statement about a lawmaker. Now, we only include statements about Napoleon in a non-constitutive explanation if Napoleon is in some way causally connected with the explained events. We can now extend this intuition to the lawmakers: The lawmakers are only included because they are *causally* relevant to the outcome. The advantage of doing this is that now we can say *why* laws are explanatory. They are explanatory because causal relations are explanatory, while causal relations give us our *paradigm* of explanation: “Why did he die? Jones killed him. Why did the garbage dump catch on fire? Lightning struck it.” We can now add the exchange: “Why did the apple fall? The lawmaker of the law of gravitation together with its being in its initial conditions caused it to do so.”

III. Things

The next step in our exposé of Aristotelian ontology is to think about what there is. The universe is made of things that are objectively delineated, identifiable and countable. What those *things* are is a question for further investigation. Maybe they are natural things like human beings, horses, nettles and their like. Maybe they are solid things like human beings, a rock, the Empire State Building and an oak tree. Maybe they are elementary

⁹ Cf. D. M. Armstrong (1983), *What is Law of Nature?* Cambridge: Cambridge University Press, and M. Tooley (1977), “The Nature of Laws,” *Canadian Journal of Philosophy* 7: 248–268.

¹⁰ J. Bigelow, B. Ellis and C. Lierse (1992), “The World as One of a Kind: Natural Necessity and the Laws of Nature.” *British Journal for the Philosophy of Science* 43: 371–378.

particles, such as electrons, photons and fermions. What is important to the Aristotelian is that it is objective reality, and not just linguistic convention, that settles what the *things* are, what they are identical with and how many of them there are.

The Sunalex, which is the mereological sum of me and the sun, is not objectively a thing. The reason it is not a thing is that it is *two* things. Now, of course one wants to retort: In one way the Sunalex is one thing and in another way it is two things. But saying this misses the objectivity involved in identifying the *things*. If in one way the Sunalex were one and in another two, then because we are looking for the *things* that are objectively delineated and objectively countable, we would have to have an objective fact of the matter about which of these it *really* is. When we talk about “*that* reality, the Sunalex,” are we talking of one thing or two things? Now, given that we must choose, it is evident that on the scientific grounds of what lends itself better to explanatory purposes it will be objectively better to talk of the Sunalex as two things rather than as one. So there already is something we can say about the things. No *thing* can be a mereological sum of other *things*. A heap of sand, then, is not a thing, for it is nothing but the mereological sum of the grains of sand. Whether the grains of sand are things or not is a more difficult question.

In any case, the universe is made up of things. We can use the Greek “*ousia*” or the Latin “*substantia*” in place of “*thing*” if we want our claim to sound as non-trivial as it in fact is.

IV. Doings

But that is not all. For, evidently, things engage in various kinds of antics. Depending on what we think things are, they may emit radiation, they may write philosophical treatises, they may “spin” as electrons do, they may gravitationally attract, they may sit colorfully or they may suffer passively. So, the things *do* various kinds of activities besides just existing.

Now, sometimes we talk of an action that is done cooperatively by several things. The torment of Ivan might be a joint doing performed by the KGB agents Natalya and Boris together with Ivan (in his act of suffering, i.e., in his non-intentional self-stimulation of C-fibers, or in his paining, depending on one’s theory of mind). But on the ontology I am recounting,

we can use our metaphysical microtome to cut up a joint action into the *activities* or *solo doings* of the things involved, some of which of course trigger doings in other things. Natalya engages in a holding of the electrodes, Boris in a pressing of the switch, and (therefore) Ivan pains. One might try to define an *activity* or a *solo doing* as a doing by a thing x such that the only *thing* involved in the truthmaker of the proposition reporting this doing is x itself, but whether this would work depends on the substantial question whether an object of an action (say, the electrodes in Natalya's act of holding) may not need to be specified to specify the action.

Now, the things we see generally vary their doings. They do not always do the same activity, though the doings do have regularities (e.g., statistical ones). In such cases, we can distinguish between the thing and its solo doings. If a thing *always* does the same thing and of metaphysical necessity *must* always do the same thing, we cannot as easily make this distinction. We can call such a thing a "disembodied form." Aristotle's prime movers are things of this kind, but not all things are like that; indeed, it is not self-evident that there even are any such things, though Aristotle in *Metaphysics* Λ attempts to prove this non-self-evident fact. Now, where we can distinguish between a thing and its solo doings, we can also ask for an explanation of why that pattern of activities obtains that in fact obtains. Moreover, we can ask for a *proximate* such explanation, i.e., an explanation p of a fact (i.e., true proposition) r which cannot be put into a sentence of the form " p explains q which in turn explains r ." An explanation is a proposition, but true propositions have truthmakers, and so we can single out a truthmaker of the proximate explanation of the pattern of activities of a thing and give it the fancy name "form."

The form, then, is some real feature of the world that enters into a causal explanation of the pattern of activities that a thing, say Callias, exhibits and could exhibit. If Callias is a flower, Callias's form explains its blooming, its giving forth of pollen, its photosynthesis and so on. It is essential to note that this form is not identical with any abstract entity, such as a "type of activity" or a "pattern," understood as something abstract and mathematical. Rather, it is something concrete in the world. It is here that the discussion of laws of nature and lawmakers comes in. Suppose we take a deductive-nomological stance towards the explanation of Callias's pattern of behavior and also take the stance that lawfulness is an ontologically primitive feature of the world, so that lawmakers cannot be reduced or their nature further elucidated. Then,

the lawmakers of the relevant laws of nature are enter into the proximate explanation of Callias's pattern of behavior, and hence are a part of the *form* of Callias. The form of Callias is related to the abstract type that specifies what the behavior of Callias in the same way as the lawmaker is related to the categorical proposition that reports what behaviors (which in fact are lawlike) occur.

Moreover, we can see that it is difficult to deny that things have forms, unless we are to take a Humean stance here. For surely there is something in virtue of which a thing acts the way it does. It is certainly not claimed that that something predetermines the activity: the explanatory relation may well be non-deterministic, as, e.g., in libertarian personal causation or quantum mechanical explanation. But that something does explain the pattern of behavior.

What there is room for disagreement about is what exactly the forms are. Are they aggregates of lawmakers of global laws? Aristotle says that they are not; rather, they are immanent in the things of which they are forms. It is here that considering the fact that our *things* are objective basic units in the composition of the universe will help. Callias, if he is a thing, must have an objective unity if he is not to be a mereological sum of other things. His activities or solo doings are something that comes in a strong sense *from him*, since after all they are his *solo* doings. But at the same time, these activities come from Callias's *form*, by the very definition of "form" given above. Therefore, there must be a relevant sense in which Callias *is* his form or at least what Callias is is defined by Callias's form. If this is so, then Callias's form cannot consist of lawmakers of global natural laws that apply equally everywhere, unless of course Callias happens to be the universe as a whole.

The possibility that our Callias is the universe as a whole and its form is the totality of the laws of nature is essentially the monistic Parmenidean suggestion that there is really only one material thing, namely the universe. For if the universe is a thing, and if the proper parts of things are not things, then if the universe which is the aggregate of all material stuff is a thing or substance, there are no other objectively delineated material things or substances. This kind of Parmenideanism is the consequence of seeing the lawmakers of the laws of nature as somehow global. If we reject this, then the intimate connection or even identity between a thing and its form ensures that we should think of forms as local and bound up with the things they are forms of. It might be argued that this in turn means that we can

reduce lawmakers in general to the interplay of the forms of existent things, because since it is the forms that are the causes of what the things do, we no longer have any explanatory need for other lawmakers than those associated with things, i.e., the forms, and so we can cut other lawmakers away with Ockham's razor.

Observe now how very different the forms are from Platonic Ideas. The Idea of Humanity is simply descriptive of, or at best normative for, what humanity is like. But this Idea is not that entity in virtue of the causal influence of which human beings do human things. The Platonic Ideas are analogous to the laws of nature considered as abstract propositions specifying what happens (that dropped rocks fall, that ravens are in fact black), and like the abstract propositions are impotent with respect to causal explanation. Indeed, how could a purely abstract entity explain concrete goings on? At best, causal explanatory prowess could be had by instances of participating, since an instance of a participating (say, of Socrates in the Idea of Humanity) can be considered a causally charged feature of the concrete world. But once we consider the instances of participating in such a way that they actually causally affect the things that are doing the participating, then it is no longer clear what role that which they are participating *in* has. E.g., the Idea of Humanity is not a concrete feature of the universe that has causal prowess. Let us suppose that that instance, call it *x*, of participating in Humanity that is Socrates's causally explains some action of his. This *x* is some feature of the concrete world—else it would have no causal power (I take causal impotence to be one of the defining features of abstracta). But then Socrates's action is explained by the causal influence of *x*, a feature of the concrete world, and in this explanation we do not invoke any non-concrete entity. *Ex hypothesi*, our *x* is an instance of a relating to the abstract entity *Idea of Humanity*; however, that abstract entity plays no role in *x*'s causal influence on Socrates, but at most in the specification of *x*—otherwise it would not be abstract. But now we can with good reason call *x* the Aristotelian “form of Socrates,” since it is that entity which in a broad sense causally explains Socrates's doings. Hence we can go from Platonism to Aristotelianism in this way, though whether this was the path actually taken is a difficult historical question.

In the case of an anti-Humean view of the laws of nature, the causal role is played not by the propositions reporting the laws but by the lawmakers, namely those features of the world in virtue of which that which those

propositions express are laws. And analogous to these causally relevant laws are the forms, which are features of the concrete world.

V. Matter

More needs to be said about the relationship between the thing and its form. If Callias's solo doings are done in virtue of that form, then, as argued before, there must be a very close relationship between Callias and that form, and probably even an identity of some sort. We could just let it be an identity and say nothing more, were it not for one empirically observable phenomenon. Things can pass away and new things come to be out of them. If horses are things, then we can note that horses die and carcasses come to be out of them. (Whether the carcass is one thing or maybe many things conjoined, is irrelevant for the purposes of this discussion.) On good empirical grounds, we do not want to say merely that the horse ceased to exist and immediately a carcass came to be, the way an effect follows a cause on Hume's account. For if we said that, then it would be eminently mysterious why the carcass of a black horse is not a white tetrahedron, but initially is approximately the same color and shape as the horse was. To explain *that*, we need to posit a causal relation between some aspect of the horse and its carcass.

But this causal relation cannot be between the horse's *form* and the horse's carcass. After all, the horse's form and carcass never exist simultaneously. For, the horse's form exists (at least in that locality—I am not prejudging here whether there are individual forms) when and only when the horse does, since it is by definition that which explains the horse's doings. Were the form to exist after the cessation of the existence of the horse, then we could not have the kind of identity between form and horse that is needed to ensure that those doings that are proximately explained by the causal activity of the form are in fact the *horse's* doings. In that case, the "form" would be an alien imposition, and the activities would be *its* activities and not the horse's. So, if the form and carcass do not exist simultaneously, there can never be a causal relation between them.

But maybe there are causal relations between temporally separated entities? Aristotle will not think so, since for him the things that do not exist now do not exist *simpliciter* and there cannot be a causal relation between an existent thing and a non-existent one, which entails that there is never a time

at which there is a causal relation between non-simultaneous entities. Even if we reject the theory of time behind such an argument, we might find plausible the claim that the horse's perishing and the production of the carcass is not an activity or solo doing of the horse's in the way that the horse's jumping (even over a cliff, when this jump is a suicide!) or the horse's neighing or the horse's kicking are. The perishing and carcass-making are very different from these paradigmatic activities. If the intuitions here are not convincing, then for the remainder of this account the reader can at least *stipulate* that "activities" do not include perishings, one's-own-carcass-makings and their like, and that the form is that aspect which explains the *activities*.

The carcass, then, comes from the horse, and there is a causal relation there. But this causal relation cannot be between the horse's *form* and the carcass. There is thus another aspect to the horse besides the form. By analogy with "lawmaker," we could give this aspect the macabre name of "the carcass maker," but let us just call it neutrally "matter." There is good reason for this neutral choice of words, namely that occasionally one thing will be transformed into something more "advanced" than itself. Aristotle thought that properly constituted rotting stuff could become a worm. Many people think that chemicals properly combined can become a life-form. On all accounts, an egg and sperm (admittedly, not *a* thing, but an aggregate) can become a human being. In a way, the Aristotelian worm is the carcass of the rotting stuff, the life-form is the carcass of the chemicals, and the human being is the carcass of the egg-and-sperm aggregate, but this is a strained way of speaking, and so let us speak of "matter" rather than "carcass makers."

What *is* this matter of the horse? One can now answer: "It is that aspect or part of the horse which proximately causally explains the coming-to-be of the carcass." If we think that such causal specification is a good way of specifying entities (it is, after all, the way that science uses in the case of many theoretical entities: The electron is that which causes the glow on cathode-ray tubes and the discreteness of electric charge measurements in Brownian motion experiments and so on), then this gives us a good definition. Seen in this way, the matter is the potentiality for being a carcass, i.e., that objective feature of the horse which grounds the possibility of a carcass's coming to be there (note how explicitly Aristotelian the language is of necessity getting at this point). It has no identity beyond that which is given to it by this explanatory causal relation.

One might alternately try to define matter as the remaining aspects of the thing once we subtract the form. But one can argue that the two definitions come to the same thing. For any intrinsic aspect of the horse can be thought of as the horse in some sense doing something or being capable of doing something: Color is the horse's ability to reflect certain wavelengths of light, mass is the horse's resistivity to acceleration, intelligence is the horse's being able to solve various problems, acceleration is the horse's current changing of speed, etc. And perishing and producing a carcass is in a sense one of the things the horse does. But it is a doing in a somewhat different sense, because what is being done is no longer simultaneous with the horse. There is only one such doing, and this is that doing by which the horse produces a carcass. Hence there is only one aspect of the horse which is not explained by the horse's form.

If, further, we accept that causal relations are simultaneous, then we conclude that the matter *persists* past the death of the horse, since it is causally related to the carcass. Indeed, we can see the being of the carcass as an activation of that capability for carcass-making which the horse's matter was. Matter is still just a potentiality, but it is a potentiality that *is* realized. Nonetheless, even in a realized potentiality one can distinguish the potentiality from its realization. So the matter persists in some way.

Of course, things can be more complicated than in the case of the horse. Something might be capable of perishing in various different ways. The matter is what grounds the capability of perishing into one or another of these then. But as there is no special problem with one thing's having a potentiality for many effects, we need not complicate the account by dwelling on such cases.

We can now make sense of the claim that what the horse *really* is is its form rather than its matter. For one, this claim entails that a horse is when and only when its form is. This is false with "matter" in place of "form," unless by "matter" we mean "the *unrealized* carcass-making matter of the horse." For another, the real solo activities of the horse are proximately caused by the horse's *form*. The matter has as its only role the explaining of the horse's perishing into the various things it can perish. The sentence, which Aristotle endorses, that "the horse *is* its matter" on this interpretation may simply say just that the potentiality for carcass-making that the matter of the horse provides is a potentiality that *the horse* has, even though it is a potentiality that can survive its demise—the carcass-maker is the horse, but considered

as a carcass-maker, not as a doer of proper solo doings. Admittedly, Aristotle likes to predicate form of matter, but that can be done as well. For the horse's form is the realization of the potentiality for being a horse which the horse's matter has inherited from having been the matter of the egg-and-sperm that the horse has come from. Insofar as it is the realization of that potentiality, it can be predicated of that potentiality, as in the phrase: "That potentiality *is* realized."

VI. Individual forms

Nothing in the above account has addressed the vexed issue of whether there are individual forms or not. The issue is whether that entity which explains your human activities also explains mine. There is nothing obviously absurd about one form producing activities in two different places at the same time. After all, those anti-Humeans who believe in global laws of nature that do not strongly supervene on dispositional properties of individual things believe in very much such a thing, since the lawmaker of these global laws of nature will be an entity very much like the forms of this account, but an entity that manages to produce activities located in various places. And in any case, Socrates's form explains the movement both of his arms and of his legs, though these are in different spatial locations. Ockham's razor favors the idea that the same form explains your human activities and mine. Against it is the intuition that my activities are *mine* and yours are *yours*, which we intuitively understand to mean that these activities are wrought by numerically different proximate causes, viz., me and you. It is not my purpose here to decide the issue as a question of Aristotelian scholarship.

As a question of philosophy, the issue is *prima facie* not a difficult one because in any philosophical account we need to preserve that which *ethics* needs—the imperative to do that is indeed a moral one—and concepts of moral responsibility are *prima facie* incompatible with the idea that your activities are explained by the causal influence of that very entity which my activities are explained by. However, this is only an opening maneuver in a discussion. After all there *are* people who think that your activities are proximately explained by the influence of the same entities as my activities are (note that "activity" here includes both the voluntary and the involuntary). These people are compatibilists who are anti-Humeans and who believe

in global exceptionless laws of nature. For, as anti-Humean believers in global exceptionless laws of nature, they hold that your activities and mine are explained by the same entity, the aggregate of the lawmakers of the global laws of nature, though they may prefer to avoid this terminology. Ultimately, I do not believe this is tenable on ethical grounds, and moreover I hold that the issue *is* best decided on ethical grounds. For it is ethics that, of all the philosophical disciplines, most carefully studies the significance of our activities.

But the issue does not seem to be capable of metaphysical resolution apart from such considerations. For the above account of forms as analogous to lawmakers shows that both views about whether forms are individual are, at least *prima facie*, coherent. The question is which of them is *actually* true. With St. Thomas, I opt for individual forms, but for ethical reasons, as described above.

VII. Form as a principle of intelligibility and conclusions

Were a thing not to have form, we could not know anything about it. For we know and define a thing only insofar as it engages in activities. These activities are caused by the form, so that by knowing the activities of a thing, we get to know its form. True, we can know something about the matter of the horse: it is that in virtue of which the horse can give rise to a carcass. But in knowing this, we only learn about what the matter *potentially* is. And even here there is an epistemological and definitional priority of form and actuality. For we know the horse's potentiality to give rise to a carcass only insofar as we know the forms or actualities involved in carcasses¹¹ and the form of the horse, since arguably it is the form of the horse that lets us identify as an individual the matter of the horse, as it is only by means of the form of the horse that the horse can be known.

When we grasp *what* a thing is, we are grasping its form, i.e., the nature of that in virtue of which the thing behaves in the ways it does. So forms

¹¹ I am not claiming that a carcass is a single thing and has a form, hence this cautious formulation. The carcass presumably is a heap of substances—a mix of primarily earth and water, Aristotle would say—and *these* substances have their forms, which I call “the forms or actualities involved in carcasses.”

are prior not only in the order of explanation of the development of natural things, but also in *logos*, in intelligibility. Finally they are prior, or at least not posterior, in the order of time, as the matter of a thing always already has a form—else it could not be identified. Hence the form is the best candidate for being a substance, since it is substance that is in every way prior.¹²

If this analysis is correct, then if some contemporary ontology has laws and particles, it is the lawmakers that are what Aristotle would consider to be most truly substances, while the particles he would consider to be mere matter, merely something existing potentially. And if the laws reduced to one global Grand Unified Theory, then in Aristotelian terms we would have to say that the cosmos is exactly one thing, as per Parmenides.¹³

The Aristotelian ontology is fundamentally an anti-Humean ontology: Not only are laws a reality over and beyond regularities, but that in virtue of which they are laws is in fact that which is most truly called substance or at least that which makes the substance be what it is. If we further take it, say, on ethical grounds, that there *are* individual forms, then we get a multiplicity of substances in the universe, including multiple substances of the same sort, and the laws of nature end up being grounded in their powers. But we have global regularities, then, only because there is coordination between the lawmakers, or forms, of the solo doings of individual entities, a coordination that entails global patterns.

¹² Cf. *Metaphysics* Z.1, 1028a 32–33.

¹³ Cf. J. Bigelow, B. Ellis and C. Lierse (1992), for an argument that might push us in this direction. This argument can, I think, be resisted by accounting for the global phenomena like conservation laws in terms of the account I offer (2013) in “Omnirationality.” *Res Philosophica* 90: 1–21.