universals and particulars is somewhat *ad hoc*—designed only for this special purpose—the notion of being a member of a class does have uses elsewhere, in logic and mathematics.

SUBSTANCE

David Wiggins

4.1. Introduction

4.1.1. The notion of a substance—of a persisting and somehow basic object of reference that is there to be discovered in perception and thought, an object whose claim to be recognized as a real entity is a claim on our aspirations to understand the world—has been host at various times to countless internecine battles, not all of them very well understood by the protagonists of the warring doctrinal persuasions. That is often the fate of technical notions. For philosophy to aspire to the state where it might avoid wars about words like those that 'substance' has occasioned (contrast just wars about the identity or nature of that which is denoted by a word with an established use), it would be necessary to give an explicit definition for every term of art, using only language that had an established everyday life outside philosophy. The effort of making definitions would identify the presuppositions of the author—which he could then avow. In cases of doubt, technical terms would be defined over and over again by each author who was prepared to use them.

Unluckily 'substance' (variously *ousia*, *on*, *hupokeimenon*, *substantia*, *ens*) was never introduced in this way. It is true that Aristotle began with the Greek word for being, which had an established life outside philosophy; and it is true that he offered definitions of substance. We shall look at one of his definitions in a moment. But the non-philosophical life of the verb to be was already a complex matter; nor did Aristotle define being/a being in such a way that anyone could readily have said what his topic of discussion was and *then* said what his thesis was about that topic. Indeed Aristotle was never in a position to fix his topic of discussion once and for all, because his conception of what ought to be achieved by a discussion of *ousia* constantly outgrew his definitions. Things did not improve when Aristotle's successors decided to treat it as more or less clear what topic it was that he had introduced—as if the only problem were to improve or complete or correct or supersede his investigation of it or to add to the list of ancillary notions that Aristotle had already introduced for its further elucidation, such as form, essence, entelechy, actuality, potentiality. (How many of his successors even paused to ask whether the notion they were concerned with was *substance* or *a substance*, for instance?) When Aristotelians or rationalists insisted upon the notion of a substance and empiricists like Hume or Russell

claimed to reject it, were they really talking about the same thing? It is hard here to disentangle topic from thesis.

4.2. An Objection and a Preliminary Defence

4.2.1. Shortly we must try to disentangle some of these things. But there is a real point in facing immediately the empiricist rejection of substance—if only because it will promote the effort to attend to what Aristotle and the rationalists meant by substance (and/or a substance).

Among representative statements of the empiricist rejection, it may be best to consider Hume, *A Treatise of Human Nature*, I. i. 16:

> We have no idea of substance distinct from that of a collection of particular qualities. . . . The idea of a substance as well as that of a mode is nothing but a collection of simple ideas that are united by the imagination and have a particular name assigned them, by which we are able to recall . . . either to ourselves or others that collection.

Compare *Treatise*, I. iv. 4:

> The imagination is apt to feign something unknown and invisible which it supposes to continue the same under all these variations: and this intelligible something it calls a substance, or original and first matter.

Compare also I. iv. 5:

> If any one should [say] that the definition of a substance is *something which may exist by itself* . . . I should observe that this definition agrees to everything that can possibly be conceived.

These are hostile characterizations by one who deliberately made no use of the idea of a substance. Inheriting the situation we now inherit—anxious not to be mesmerized by the history of the subject yet unable to turn our back on it lest we repeat old errors or neglect old insights—we can only gain a fresh or authentic grasp upon the ideas that Hume was rejecting by referring back to the questions that prompted Aristotle to introduce them and his inheritors to take their stand upon them. Grasping the sense of 'substance' from these philosophical uses, we must look for a unitary or central idea of substance: but we have to be ready for the possibility that the idea is sustained by a diversity of theoretical interests, some of them enjoying better philosophical prospects than others. Unless, of course, we now want to abandon it. But to abandon it is less easy than Hume has made it appear.

Look back at Hume's characterizations. How else can a set of qualities cohere together than by being properties of one and the same subject? Or, abandoning that line of defence as question-begging, let us ask what sort of a collection it was that Hume had in mind. How is it to be specified? Either the kind of

collection Hume speaks of is specified by reference to some subject of the properties, or else it is specified enumeratively by reference to the properties that are members of the collection. In the first case, Hume does not escape the questions that come with the idea of the subject of the properties. In the second case, every new property and every old property deleted must result in a new collection of the kind Hume proposes. But then there will be no question of doing justice to the thought, which we do not know how to do without, that we can gradually amass and correct a larger and larger amount of information about one and the same thing, the same subject, and can come to understand better and better in this way how these properties intelligibly cohere or why they arise together. Nor is there any question of doing justice to the thought that this last is what we *have* to do if we are to make sense of the world at all. Salient among things that we have to recognize, if we are to make sense of the world, are the substances. Or that will be the claim of those who lie within the sphere of influence of Aristotle.

4.3. Aristotle's First Account of Substance

4.3.1. The idea of a substance (henceforth, till further notice, *a* substance) begins its serious philosophical life in Aristotle's *Categories* (treated in Chapter 7, Section 1.2. following). A substance—or, in the terms of that work of Aristotle's, a primary substance—is something that is neither in anything else nor predicable of anything else. That is a definition of a sort. It is Aristotle's earliest definition of a substance. Point and sense need clarification, but the intuitive idea that Aristotle appears to be seeking to explicate in these terms may prove to be as good a thread as any by which to find our way.

Begin with the idea of a subject of discourse, or anything at all that you can talk about. Then we arrive at substances by disentangling them from other subjects of discourse.

Among the different subjects you can talk about, some are and some are not in others in the way in which colours and their determinate shades are in things. Some are and some are not in things in the way in which knowledge in general or some specific and particular knowledge (e.g. that 'Socrates' is spelled with the letter sigma in Greek) is in things. (Henceforth let us italicize this special *in*.) To the extent that anything is not *in* other things in this way, it enjoys a certain autonomy. Something that has this autonomy may be causally dependent on other things in the way in which the infant depends on the mother; but, ontologically speaking, it is still independent—at least to the extent so far explained. Note also that according to this conception, before it is made radically stricter in the way in which it was at the hands of Leibniz, ontological autonomy of the kind we are concerned with is prima facie consistent with one substance's being a part of another substance.

On Aristotle's view of matters, when items are excluded that are *in* other items, the items that are left over to be ontologically more fundamental are genera like animal, species like horse or man, and particular concrete things like Arkle or Victor or Socrates. But now, if we stipulate that a primary substance should be not only ontologically autonomous (not *in* anything in the manner previously explained) but also not predicable of anything else, then animal, horse, or man—secondary substances, as Aristotle calls these—can be set aside as less fundamental than particular concrete things. A particular concrete thing, Socrates or Arkle, is the sort of thing that *is* other things (e.g. is a man, is an animal, is a horse) and can be *qualified* by other things (e.g. colour or knowledge). But it is not itself true of other things. Nor does it qualify other things. Rather, a concrete substance, a this such-and-such, is the sort of thing to support and to make possible all other kinds of subjects of discourse.

Suppose that is all right so far. Then, if the question is asked, 'What makes up the world?', one kind of answer can be found in the claim that the primary substances are the basic constituents of the world and that everything else that is is by virtue of being either one *kind* of primary substance (that is, by virtue of being some secondary substance), or by virtue of being some *qualification* of primary substance, or . . .

4.3.2. Entering into philosophy on these terms—furnishing an answer to displace or improve upon certain sorts of Pre-Socratic answer to the question of what there is, the Milesian or Eleatic answers, for instance—the notion of a substance is of course attuned from the outset to an ontology of things that are salient and privileged within the world-view of a human inquirer, the inquirer who reasons, argues, draws conclusions, asks questions about the world, and inquires there for an answer to these questions. Such a one thinks of primary substances as *continuants*, and he thinks of himself as one continuant among many, etc. Such an inquirer has from the nature of the case to be ready or eager to make new discoveries about these or those substances, to conclude that certain primary substances that he has recognized as a kind are composed thus or so, or behave thus and so, or whatever. He is ill prepared for the suggestion that the world of primary substances is a mere by-product of his natural and epistemological situation; that the one and only real world is a world of flux, or a world of atoms or electrons or packets of energy, or a world where the persistence of a particular through time is problematic. He might be better prepared for the opposite suggestion, that these other entities were abstractions from the familiar world of primary substances.

There are real issues here. But if we postpone them and we prescind from the issue of the ultimacy or privilege of the human viewpoint that descries the Aristotelian primary substances or singles them out, then it will be best to

accept that there are such things as the primary substances Aristotle delimits. Unless and until we are prepared to take it as a brute fact that substances such as Aristotle recognizes are presented to us as things that are *there anyway*, ready to be picked out as this man, that horse, etc., the philosophical issue of substance will be more or less unintelligible to us. (The reader will now find that a provisional conviction is forming in his mind that the interest in substances as the locus or concern of systematic inquiry in its first stages is a more durable interest than the interest in substances as the fundamental things that make up the world. See Section 4.13.1 following. See also 4.6.1.)

4.3.3. What else is there to say about substances ordinarily so conceived, in advance of any particular study of particular kinds of them? Well, working freely from the suggestions that Aristotle furnishes in chapter 5 of *Categories* and exploiting the connections between primary and secondary substances, one may take off from the point that, given any object that is putatively a primary substance, one can ask the question 'What is this thing?' and expect there to be a certain sort of answer to the question. This will neither presuppose another answer in the way in which 'runs' or 'white' do (these are answers in the Aristotelian predication-kinds *what it is doing* and *what it is like*, which presuppose the first predication-kind, namely *what it is*) nor presuppose another answer in the way in which 'tinker', 'tailor', 'soldier', 'sailor' do. (A soldier is a man who is engaged to fight for a given army, a sailor is a man in some way engaged in navigation, etc.) Rather, the answer must bring us to a certain sort of conclusion, as 'man', 'horse', or 'daisy' do. Unless some such conclusory answer is provided to the question 'What is it?', it is indeterminate what we are thinking about. (If it is indeterminate what we are thinking about, the situation is not to be redescribed as there being something indeterminate that we are thinking about. It is not yet a situation in which there is *anything* we are thinking about.)

It is true of course that conclusory answers to the question 'What is it?' will be required for any object of reference whatever, in whatever ontological category, *quality*, *quantity*, *relative*, *place*, *time*, etc. It should also be remarked that there are objects of reference in the non-Aristotelian category of *event*, and further objects in any further ontological categories there may be, of *state*, *process*, etc. Where substances are at issue, however, conclusory answers will identify primary substances by determining which secondary substance a given object falls under (horse, animal, plant, etc.). By inviting us to see the object in question as *this such-and-such* or *that so-and-so*, these answers will not necessarily say what complete account is to be given of the nature of continuants like the one in question, but they will positively commit the identifier in certain ways about the empirical nature of things of its sort. Such answers identify the object as one of a class of continuants whose stereotype will be that members of the class *sur-*

vive certain sorts of change, *come into being* in a certain specifiable way, *tend to be qualified* in certain specifiable ways, *tend to behave* in certain specifiable ways, and *tend to cease to be* in certain specifiable ways.

We need an example. One might identify the thing one finds under a tree-stump by saying 'See that maggot!' Identifying it as a maggot commits the identifier to think of it as a creature with specifiable tendencies of movement and behaviour (e.g. flight from light or interference) of which a great deal more might be discovered, as a creature with a certain life-cycle of which much more might be discovered, as a creature with a certain way of appearing, and so on. If that is right, then to pick something out as a maggot is to take a certain epistemological risk (which is how it should be) and to subsume it under a conception that the entomologist's conception supplements, sorts out, and situates in a larger explanatory framework. This is the place to remark that the entomologist's work will reveal that the maggot is the larva of the fly commonly called the bluebottle and that 'maggot' is not the unproblematically conclusory answer that it seemed to the question 'What is it?' An entomologist will study in depth the actual nature of this species of insect. By these efforts, he will focus the question—make it clearer what the issue turns on—and he will also reveal the further facts by which the question might be determined whether an arbitrary *w* is or is not the same thing (the same insect) as that maggot.

4.4. Kinds and Activity

4.4.1. Consolidating all this, we may say that primary substances belong to kinds (or secondary substances) whose members (instances) will receive different and opposite qualifications at different times: they persist through change—not just any and every change but changes that can be specified on the basis of an explanatory true account of the way of being and acting of members of the kind, or on the basis of their mode of activity, as one might say. This last, the principle of activity, will be founded in their shared nature, which Aristotle characterized at a later moment in his philosophical development (but compatibly enough with *Categories* in respect of the point we are concerned with here) as follows:

> The primary and proper sense of nature/*phusis* is the *ousia* [being, way of being] of those things which contain in themselves as such a source of change [or principle of activity]. Matter is called nature/*phusis* in so far as it is capable of receiving this nature/*phusis*, and the processes of generation and growth are called nature/*phusis* because they are processes derived from this nature/*phusis*. Nature/*phusis* in this sense is the source of change in natural objects [that is substances], which is somehow inherent in them, either potentially or actually. (*Metaphysics*, book 5, 1015^{a}11)

Substances are things that have a source of change or principle of activity within them. He who has the conception of a particular kind of substance *k* endowed

with the corresponding particular nature and, by means of that conception, grasps the concept of horse or plant or man or bluebottle, or whatever *k* it is, is one who can single out *k* things. He can tell them apart from other things, or draw boundaries around them. He knows what it is synchronically to tell one from another and, understanding the principle of activity of things of the kind *k*, he knows what it is diachronically to trace a particular one of them through space and time. More picturesquely, substances are what the world is articulated into when the segmentation of kinds corresponds to the real divisions in reality. (In Aristotle's picture, the world will be articulated into substances without distinct substance-concepts ever cross-classifying anything, that is without one and the same entity's turning up in the extension of any two of them.)

4.5. Further Developments of the Aristotelian Idea

4.5.1. Substances are what the world is articulated into when the segmentation of kinds corresponds to the real divisions in reality—or so the philosopher of substance will say. Can we lend any serious, better than pictorial, content to this reality claim? Here are two ways in which we might do so.

First, when the world is divided into the kinds or sorts *f, g, h, j, k,* ... that divide it into true primary substances, there will be, for each such *f*, indefinitely many true generalizations in the form

for every *x* such that *x* belongs to *f*, *x* is ϕ,

where being ϕ is a property well chosen for *f*. That is to say that an Aristotelian secondary substance *f* that articulates genuine primary substances will make possible the extrapolation across all *f* things of a host of manifest or discoverable properties. In further development of this, one notices that this is the place to accommodate an insight that originates with Bertrand Russell. Suppose we go down to the beach and for the first time in our life we encounter a seal; and suppose that we hear the seal bark. Then, if we venture the guess that all seals bark, nature will reward our daring. Barking (unlike being wounded or ill, say) is a property that is well made for extrapolation across the whole class of seals. When we divide the world into the kinds that divide it into true substances, we find indefinitely many kind–property pairs $\langle f, \phi \rangle$ that are well made for scientific generalization and the other purposes of description and explanation. What is more, we know what it is for this condition to fail. If we were to treat the complement of each secondary substance or substance-kind as itself a secondary substance or substance-kind—something that Aristotle cautions us against at *Categories* 3^b26—we should find no such kind–property pairs. (The complement of a kind would comprise absolutely everything that did not belong to that kind.) If, despite our not falling into this absurd error, the kinds

we divide the world into nevertheless fail to determine genuine substances, then there will be rather few kind–property pairs that are well made for scientific and explanatory generalization. Or that is the picture.

There is a second, more complex way in which content might be attached to the claim that a system of secondary substances that subsumes the genuine substances will segment kinds in a manner conformable to the real divisions in reality. We begin with the point that, if we have an entity x that belongs to the genuine secondary substance or substance-kind of *f*s, then x is not more or less of an *f* than other things that belong to that kind . . . (Nor, incidentally, is it more or less of a substance than some object y that falls under a distinct substance-sort or secondary substance k.) The Aristotelian claim is that, given a true secondary substance g, either the object x is a g and fully a g or x is not a g at all. ('Substance, it seems, does not admit of a more or a less . . . any given substance is not called more or less that which it is' (*Categories* 3^b34–6).)

That is one point. The next point we need, if we are to find the further content that we seek for the reality claim, relates to the logic of identity. Suppose that an entity a is the same as an entity b. If so, then whatever is true of a is also true of b and vice versa. (This principle is often called Leibniz's law, because it is entailed or presupposed by Leibniz's stronger two-way claim, *eadem sunt quorum unum alteri substitui potest salva veritate*: 'the same are those things that can be substituted the one for the other without detriment to truth'.) But every object is entirely determinately the object it is. So, manifestly, the object a is entirely determinately the same as the object a. But then, by Leibniz's law, if a is indeed b, b is entirely determinately the same as the object a.

The result has been found controversial by some writers. But in truth the deduction is simple and elementary and depends only upon two things: (1) the weakest and most modest of logical principles and (2) that which is utterly distinctive of the concept of identity (Leibniz's law). The real doubt it ought to leave us with is not the question of validity but the question of how to sustain the application to the world of so strict and unrelenting a conception as the deduction shows our conception of the concept of identity to be. How shall we answer that question and relate it to the logic of primary and secondary substances?

Here let us attend once more to what it takes for an object of reference to be singled out. We have stressed that what is singled out is never a bare this or that, but this or that *something or other*. We expect the sortal or secondary substance identification of an object to commit the identifier to provide whatever is needed to put himself or another into a position to specify what it turns on whether or not an arbitrary object w, referred to in whatever way (whether or not synchronically with our reference to the object we have in mind), is or is not the same as the object singled out. (How else could we count as making it clear which object is at issue?) But in that case we should not assume that just any

grammatically suitable filling can count as the adequate or explicitly conclusory value for the 'something or other' that says what the thing singled out is. Not just any substantive stands for a genuine secondary substance. An example may assist. We can pick out someone as a poet. But, alerted by Aristotle, one will note that one person *can* be more or less of a poet than another. This confirms the fact that 'poet' is not a conclusory answer to the question 'What is it that is singled out here?' 'Poet' rides on the back of the answer 'human being'. (Let us fill out the example a little. Byron was born in 1788. But the baby who was born in 1788 was not the same poet as the poet who published *Childe Harold* I–II in 1812. For the baby was not a poet. The baby was, however, a human being and the same human being as Byron, the poet. It is in the light of what a human being is and does that the identity of baby and the author of *Childe Harold* has to be judged. It is in the light of the corresponding principle of activity that the biography of the human being who became the poet is to be understood.) What then do we expect of 'human being' if that is to be the properly conclusory answer to the *what is it?* question. Well, if it is satisfactory, it must underwrite the definiteness both of the question 'Is *w* the same as the thing singled out?' and of all satisfactory answers to that question.

That is what reference and singling out require. What follows? It follows that any system of secondary substances with a claim to separate reality into its genuine primary substances must arise from an understanding of some set of principles of activity on the basis of which identity questions can be glossed as questions about the holding or non-holding of a completely determinate relation. This is not to say that everything that is needed can be written down or said in a finite space—only that the system of real secondary substances must be such that there can be an open-ended understanding of the system that is good enough for it to be capable of being filled out *ad libitum* to the point where any identity question that actually arises can be glossed or elucidated as a question about the all-or-nothing relation that we have seen identity to be.

4.6. Legacy of the Aristotelian Conception

4.6.1. These are exigent requirements that the philosopher of substance is making: and it will now be manifest that, because of the close coherence that is coming to light between the formal logic of identity, Aristotelian metaphysics, and Aristotelian philosophy of nature, the philosophy of substance is in danger of committing us to positions that the progress of science since Aristotle makes it harder and harder to sustain. It no longer seems right to look for philosophical support for the scientific ultimacy of a biological and physical science pitched at the particular level of insight that Aristotle himself found so compelling and at which he expected to be able to describe the operation of an explanatory set of final causes. (See *Physics*, book 2.) Plainly, we must come back to this, only

remarking here that the theory of substance becomes yet more complex in Aristotle's writings subsequent to the *Categories*. It also becomes more confusing, in ways to which we shall recur. (See Section 4.11.2 below.) In the interim, however, let us mine the conceptual riches that come to us with the simple neo-Aristotelian conception.

The idea we now have of a primary substance is not the idea of a 'we know not what'. Nor is it the idea of substance that we find in Kant, when, under the influence of Hume, he writes: 'People have long since observed that in all substances, the real subject, that which remains after the abstraction of all accidents (as predicates), remains unknown' (*Prolegomenon to Any Future Metaphysics*, sect. 46). The real subject Socrates or Arkle is one and the same as the palpable, perceptible substance Socrates or Arkle. This is nothing inherently unknown. It is something we know much about, albeit imperfectly. And, however difficult the empiricists were destined to find the Aristotelian idea of a substance—we have already seen Hume's hostile account of these things—this is the notion of substance we find has been communicated by the Scholastics to modern philosophy as it was before Kant or Hume—or at least to the rationalists—when Descartes claims that a substance is something that exists in and through itself and can exist without dependence on anything else (*Fourth Replies*, 226) or when Spinoza stipulates:

> By a substance I mean that which is in itself and is conceived through itself: that whose concept makes no essential reference to anything else. (*Ethics*, first part, definition III)

It was this same notion that Leibniz was drawing out further when he wrote in his correspondence with De Volder, the Dutch physicist,

> Nothing is permanent in a substance except the law itself which determines the continuous succession of its states and accords within the individual substance with the laws of nature that govern the whole world.
>
> Simple partless substances are nothing more than sources and subjects of the whole unfolding series of perceptions. These series of perceptions all express with the greatest and most fitting variety the same world of phenomena. By these means the supreme substance communicates its own perfection so far as it is possible to many substances which depend upon it. Each of these many substances must be conceived as a microcosm or concentration of the whole world and (some less so, some more so) as, so to speak, an assemblage of the attributes of divinity. Nor do I think that any other rationale for the way of things can be understood. Everything had to be this way if it was to be at all.

Aristotle had not said in *Categories* that substances were partless or the sources and subjects of the whole unfolding series of perceptions. The world-view of the rationalists was no longer that of Aristotelian science. It was anti-Aristotelian. But the rationalists continued to conceive of intelligible ultimate reality in terms of the substances that make up the world. They conceived of

substances both formally and in respect of their explanatory role much as Aristotle had. Leibniz's search for that which underlies all the rest of reality had begun with the Aristotelian conception of a subject of predications (*hupokeimenon*) conceived as that which is self-sufficient and in no need of other things. Then he was led to doubt that any true substance could stand in a part–whole relation to any other substance, or be other than causally autonomous. His disagreement with Aristotle issued in a disagreement about the extension of the notion. But (even at the furthest point, where Leibniz concluded that only souls or soul-like things could be substances) this was still a reinterpretation of the original idea of substance in Aristotle, whose influence we can see directly at work in such passages as this:

> Aristotle has called nature the principle of motion and of rest. . . . [The] divine law once established has truly conferred upon substances some created impression which endures within them or . . . an internal law from which their actions and passions follow . . . there is a certain efficacy residing in things, a form or force such as we usually designate by the name of nature, from which the series of phenomena follows. (*On Nature itself or on the Inherent Force and Actions of Created Things*, Gerhardt, IV. 505)

4.7. The Collision of Rationalist and Empiricist Claims

4.7.1. Prescinding from the various farther determinations of the idea of a substance that are proprietary to the rationalists and postponing further difficulties (already mentioned but not yet expounded) with which Aristotle embarrassed the idea in his later writings, the time has come to ask why the idea of a subject that is an individual substance represented such a difficulty for the empiricists.

Perhaps the best place in which to witness the clash between empiricism and the philosophy of substance is Leibniz's *New Essays*. This work represents a conversation between Locke, whose part Leibniz compiles from Locke's *Essay* and assigns to a character he calls Philalethes, and Leibniz himself, whom he calls for these purposes Theophilus. The most important exchange on this matter is at II. 23. In Bennett and Remnant's translation of chapter 23 ('Of our Complex Ideas of Substances') we have:

> PHILALETHES. §1. The mind takes notice that a certain number of 'simple ideas go constantly together: which being presumed to belong to one thing . . . are called so united in one subject by one name; which [through heedlessness] we are apt afterward to talk of . . . as one simple idea, which indeed is a complication of many ideas together'.
>
> THEOPHILUS. I see nothing in the ordinary ways of talking which deserves to be accused of 'heedlessness'. We do take it that there is one subject, and one idea, but not that there is one simple idea.

What gloss have we committed ourselves to make (see Section 4.2 above) on this exchange? The idea of the sun cannot be a conjunction of properties, we

have said, because that would mean that, whenever we learned a new property of the sun, we should have got ourselves a new 'complication' and a new idea of the sun. Every enrichment or impoverishment would have to determine a new complication. Surely the idea of the sun needs rather to be the idea of that which *has* this and the other properties. Locke recognizes this, but it seems that he recognizes it in his own way. He continues:

PHIL. Not imagining how these simple ideas can subsist by themselves, we accustom ourselves to suppose some substratum [something which supports them] wherein they do subsist, and from which they do result, which therefore we call substance.

THEO. I believe that this way of thinking is correct. And we have no need to 'accustom' ourselves to it, or to 'suppose' it; for from the beginning we conceive several predicates in a single subject, and that is all there is to these metaphorical words 'support' and 'substratum'. So I do not see why it is made out to involve a problem. On the contrary, what comes into our mind is the concretum conceived as wise, warm, shining, rather than abstractions or qualities such as wisdom, warmth, light etc., which are much harder to grasp. (I say qualities, not ideas.) It can even be doubted whether these accidents are genuine entities at all, and indeed many of them are only relations. We know, too, that it is abstractions which cause the most problems when one tries to get to the bottom of them. Anyone knows this who is conversant with the intricacies of scholastic thought: their thorniest brambles disappear in a flash if one is willing to banish abstract entities, to resolve that in speaking one will ordinarily use only concrete terms and will allow no terms into learned demonstrations except ones which stand for substantial subjects. So to treat qualities or other abstract terms as though they were the least problematic, and concrete ones as very troublesome, is to 'look for a knot in a bullrush' [Plautus], if you will allow me the phrase, and to put things back to front.

The way in which Locke really needed to see the complication of ideas (or qualities) that make up our idea of the sun was as follows: we conceive of the sun by conceiving of it as a substance/substratum (something he says we do not know) which shines on us *and* warms us *and* rises *and* sets *and* . . . Perhaps that is how Locke himself did see the relevant complication, even at the point when he decided to describe our ignorance of the nature of the sun as an ignorance of that which the ideas or qualities *shine*, *warm*, . . . inhere or subsist in. Indeed, if I understand him aright, this is how Michael Ayers reads Locke in his 'Ideas of Power and Substance' (see Bibliography). Ayers argues in a way sympathetic to Locke that our ignorance of the substratum is not distinct from our ignorance of the real essence or nature of a given kind of thing: it is our ignorance of the second of these things that shapes Locke's whole treatment.

Yet this ('the idea of the sun is the idea of a substance/substratum which shines on us *and* warms us *and* rises *and* . . .') was not the way in which Leibniz read Locke; and it seems that even Ayers is prepared to allow the other and traditional reading the measure of support that is restored to it when he states his own reading as follows: 'In order to mark the presumption of such a natural

unity among [the powers, dispositions, properties that] we include under one complex idea on the basis of their observed coexistence [in a given kind of thing], we add the idea of "some substratum wherein they do subsist and from which they do result". Substance is a dummy concept. Locke's derision is directed against those who suppose it is something more.' The reason why this exposition supports the traditional reading, even as it seeks to subvert it, is that, on the sympathetic reading ('the idea of the sun is the idea of a substance/substratum which shines on us *and* warms us *and* rises . . .'), there cannot be any possibility to *add* the idea of substratum—if only because, in its absence, we could never have *embarked* upon giving the conception that the sympathetic interpretation claims Locke says we have of the sun. The substratum is required by the very grammar of the more sympathetic reading. (By the '. . . which – – – and . . .' construction, that is.) It is not optional. Hence the charm of the reading by which it *can* be added in just the way in which Locke seems to add it.

For this kind of reason or for other reasons, few if any of Locke's philosophical successors were able to understand Lockean 'complications' of ideas otherwise than as follows: the idea of the sun is a complication of the idea of shining and/with the idea of warming and/with the idea of rising and/with the idea of setting and/with the idea of substance, which is the idea of we know not what support or substratum. (Note the entirely different role of 'and' in this reading and the sympathetic reading, as I began by stating that. In that statement 'and' conjoined sentential clauses. In this traditional reading of Locke it means, more or less, 'conjoined with'.) The complication in question amounts then to a series of items that Leibniz calls abstractions.

Leibniz is only the first of many to read Locke in this way. It seems obvious that Hume read Locke very similarly. If Hume had read Locke in the other way, he would have had much more difficulty in taking substance to be as superfluous as it was (according to Locke) inscrutable.

4.8. Subject and Properties

4.8.1. Here let us continue the exchange between Philalethes and Theophilus.

PHIL. §2. A person's only notion of pure substance in general is that of I know not what subject of which he knows nothing at all but which he supposes to be the support of qualities. We talk like children; who, being questioned, what such a thing is, which they know not, readily give this [to them] satisfactory answer, that it is something; which in truth signifies . . . when so used . . . that they know not what it is.

THEO. If you distinguish two things in a substance—the attributes or predicates, and their common subject—it is no wonder that you cannot conceive anything special in this subject. That is inevitable, because you have already set aside all the attributes through which details could be conceived. Thus, to require of this 'pure subject in general' anything beyond what is needed for the conception of 'the same thing'—e.g. it is

the same thing which understands and wills, which imagines and reasons—is to demand the impossible; and it also contravenes the assumption which was made in performing the abstraction and separating the subject from all its qualities or accidents.

At risk of painting the lily, let us distinguish within Theophilus' diagnosis two distinct objections.

First objection. The Lockean idea of an *I know not what*, the bare idea of a substratum, which Hume later dispensed with but Locke added to the other ideas that Leibniz thinks Locke thinks of as jointly constituting such-and-such a substance, is only the product of the separation of the subject from all its properties.

How was such a separation possible? Well, obviously no substance is any property or quality. It does not follow from this, however, that a subject can be conceived of as *lacking* just any or every arbitrary set of properties. It would have been helpful, and it would have discouraged Philalethes from giving his thesis about the limitation of human understanding of material objects and our ignorance of their real essence a most implausible formulation, if at this point Theophilus had mentioned Aristotle's distinction between answers to the question '*What is* this thing?' and answers to the question 'What is this thing *like*?' Perhaps the empiricist knows as well as anybody else that the process of abstracting all the properties from a subject and amassing them as a conjunction of qualities will in the end cause the subject itself to disappear. But the real palpable subject becomes invisible even more quickly than the empiricist realizes. It becomes invisible so soon as one seeks to abstract from the subject, a dog, a horse, a man, a tree or whatever, the property of being a dog or a horse or a man or a tree. What is an individual tree taken in abstraction from its being a tree? What is a dog when one prescinds from its being a dog? How are these things even to be conceived under this abstraction? If the subject is that which has the qualities, why suppose that we can reach this subject by not thinking of it as having any qualities, not even the qualities that are essential to its being singled out as that very subject? (Or even worse by thinking of it as *not having* any qualities.) The *bare idea* of a subject is one thing. To have such an idea is to conceive of an ordinary subject while leaving it entirely *open* what the subject is. (One can only approximate to that sort of conceiving. For when we seek to imagine how things might have been for a certain thing x, we have to hold constant what x is, what palpable substance it is, and only then can we explore all the variations in how it might otherwise have been that are consistent with what x is.) The idea of a *bare subject* is an altogether different thing; no reader of Aristotle's *Categories* will ever agree to make sense of it. By subject (*hupokeimenon*) Aristotle had meant the visible, palpable subject that has qualities—not a substratum that is in itself quality-less, or has no qualities.

In short, every empiricist about substance must measure how far he stands from the seductively inviting but utterly absurd claim that, because the subject is what *has* the qualities, it has itself *no qualities*. The fact that 'substratum' began as a Latin translation of Aristotle's ordinary word for 'subject', namely 'hupokeimenon', but then came to be understood as denoting something hidden, then as denoting an absurdity, only signals how old and how persistent the temptations are to commit the confusions with which Theophilus here charges Philalethes, never mind whether justly or unjustly. (For Aristotle's own albeit modest contribution to this confusion, see below, Section 4.11.2.)

That is one objection. Here is another just distinguishable objection. Locke insisted that, in speaking of substance as we know not what, he in no way intended to deny the existence of substances, i.e. the kinds of things that answer to what he calls in the heading for II. 23 'our complex ideas of substances'. (Cf. Locke's Letter to Stillingfleet, pp. 32–3.) But, from the nature of the case, Locke's doctrine leaves us wondering how there can be different kinds of *substratum*, or different determinations of the determinable 'pure subject in general'. It leaves us still inquiring for the better understanding that is needed to overcome the division Locke so recklessly insists upon—and that any Aristotelian must reject—when he writes that 'all the idea of substance of anything is is an obscure idea of what it *does* and not any idea of what it *is*'. (Cf. *Essay*, II. xiii. 19–20.)

4.9. Clear Ideas and Ignorance

4.9.1. Just once more let us revert to Philalethes' and Theophilus' conversation:

PHIL. §4. We have 'no clear idea of substance in general' . . .

THEO. My own view is that this opinion about what we don't know springs from a demand for a way of knowing which the object does not admit of. The true signs of a clear and distinct notion is one's having means or giving a priori proofs of many truths about it. I showed this in a paper 'Meditations on Knowledge, Truth and Ideas' [Gerhardt, IV. 422–6]

The point becomes clearer in the light of the paper of Leibniz's that Theophilus cites. Clear and distinct knowledge—knowledge that not only supports recognition (clearness) but also represents the analysis and exhaustive enumeration of the marks of a kind (distinctness)—is too much to ask in an area where (from the nature of the case) there is no question (for finite minds such as ours) of a priori proofs. No readily imaginable extension of our scientific understanding could give those. But there is something else that is a possibility for us, namely clear *indistinct* knowledge, and this is knowledge too. (Leibniz sometimes calls this clear confused knowledge.) That is to say that, where understanding is based on ideas that suffice for the recognition of kinds of things, even if it falls

far short of the enumeration of all the marks of the kind, such understanding can count as knowledge. Such is the ordinary knowledge that we have of what a man or a horse is; and such is the knowledge we have of Socrates or Arkle. It is on this possibility that we depend, moreover, for our grasp upon the sense of ordinary substantives like 'horse', 'man', etc. That grasp becomes philosophically intelligible when we reconstruct it, however artificially, as follows. Suppose we do not know what 'horse' means. Then someone can say to us, pointing to a horse:

> That is a horse. A horse is anything that resembles that thing in the right sort of way. If you want to know what the right sort of way is, well, simply on the basis of how much you need to know, study that thing, study what it does, study how it behaves and how it interacts with other things. When you have studied it well enough to have a reliable recognitional capacity of the kind—and this will come very swiftly indeed—then, even if you stop there, you will know, however minimally, what a horse is. You will know enough to understand 'horse'.

In our own times, the principal champion of one version of this Leibnizian conception of the semantics of natural kind substantives has been the American philosopher Hilary Putnam. (See his 'Is Semantics Possible?', in *Collected Papers*, ii.) We must note, however, that the reconstruction just offered cannot *guarantee* that speakers will always grasp the sense of names of new kinds of substance. Nor does it guarantee that all substantives that people try to introduce in the manner described will have senses that are well founded. Nothing ought to guarantee either of these things. The reconstruction explains the one thing that needs explaining, namely how, where a substantive does have a well-founded sense, a grasp of the sense is possible. The reconstruction builds upon a natural and convincing account of how ordinary knowledge of such things as ordinary substances is possible.

One word more to those who persist in a preference for Locke's attribution to us of ignorance over Leibniz's attribution to us of clear indistinct knowledge. What kind of ignorance is Locke attributing to us? This ignorance, is it a privation of *knowing of*, or is it a privation of *knowing which*, or is it a privation of *acquaintance*? Or what is it a privation of? If, as it seems, knowing of, knowing which, and acquaintance are all different kinds of knowledge, surely the lack of one of these may be different from the lack of any other. Even if we are indeed ignorant in that way, why should we not count as having clear indistinct knowledge of substances—of substances themselves?

4.9.2. The combination of ideas that we have drawn from Aristotle and Leibniz is a powerful prescription against most of the vexations with which empiricists from Hume onwards—J. S. Mill, Ernst Mach, Bertrand Russell, and A. J. Ayer, for instance—have attempted to undermine the concept of substance (or in

Mill's case, to reduce it to that of mere body). What now stands in the way of the proper reinstatement of the concept? Three things perhaps. First there are certain unintended effects of the symbolism of modern logic. (See Section 4.10.1 following.) In the second place, there are the further accretions to the doctrine of substance for which Aristotle himself and his admirers have been responsible. (See Section 4.11.2 following.) Thirdly, there is some continuing obscurity about the need, if any, for an idea of substance that is more than an idea of body. (See Section 4.13.1.) We shall conclude by attending to these points.[3]

4.10. Recent Further Misunderstandings of Substance and Property

4.10.1. In any account of substance like the Aristotelian one, we have seen how important it is to mark the distinction between predications that answer the question *what is x?* (sortal predications, as they are often called in present-day philosophy) and predications that answer questions like *what is x like?*, *how big is x?*, etc. The symbolism of modern first-order logic, employing the notation 'ϕx', 'ϕx' for all such answers, does not mark this distinction. Indeed it has discouraged many twentieth-century philosophers from attending to it. (Not all. See the references to Strawson and Quine in the Bibliography.) In truth, however, modern logic neither forbids nor obstructs the distinction. Nor, it must be added, does it direct us to see the distinction as a mere distinction in idiom rather than as what it is, namely, a distinction in thought.

Something similar needs to be said about a difficulty that has recently been urged against the very idea of continuants that endure through time (all in one piece, so to say) by philosophers who have wanted to replace the ontology of enduring, changing substances with a supposedly more basic ontology of things-at-moments or things-in-phases (or of shorter-lived objects, not changing in their

[3] Before going on, the reader may wish to test his or her degree of acceptance of the contentions so far advanced by considering what answer to offer to three questions: *Question 1*: 'This table is the same and not the same as the table I bought four years ago from the furniture store in Westbourne Grove. It is one and the same table: but it is not in the same condition.' Is Aristotle's distinction between the categories of substance and quality helpful in explicating the difference here signalled between numerical identity and qualitative identity? (This author would say 'yes'.) *Question 2*: 'My table is now brightly, now dimly lighted. Its temperature varies. It may receive an ink stain. One of its legs may be broken. It may be repaired, polished and replaced part by part. But, for me, it remains the table at which I daily write . . . A body is one and unchanged only so long as it is unnecessary to consider its details' (Ernst Mach). Is it all right to assume, as Mach apparently does here, that what it involves for table T_i, with no ink stain and all its original legs, to be *strictly* one and the same table as table T_j, with an ink stain and two legs of recent provenance, is for T_i and T_j to figure in the history of a table that *has not changed*? What would Aristotle have said about that? Can Mach really restore plausibility to his conception of these things by saying that it may be 'unnecessary to consider' the changes that have actually taken place; that *for me* the table is the same? (Your author would say 'no'.) What further comment, if any, do you want to make on the last sentence quoted? *Question 3*: Noam Chomsky has written: 'If we abstract from the perspective provided by natural language . . . then intuitions collapse: Nixon would have been a different entity, I suppose, if his hair were combed differently.' What are you moved to say about this claim?

intrinsic properties, see below), which they suppose to be scientifically or metaphysically less problematic and from which they expect to be able to see enduring, changing continuants as composed. These philosophers are constructionalists, one might say, with respect to substances. They expect to be able to treat questions like whether x is the same man as y by deploying some equivalence of the following general kind: x is the same man as y if and only if the thing-at-a-moment x (thing-in-a-phase x) bears to the thing-at-a-moment y (thing-in-a-phase y) the ancestral of that relation R (whatever R may be) which holds between arbitrarily nearly simultaneously existing men-at-a-moment or arbitrarily temporarily close men-in-a-phase. (Explanation of 'ancestral': x bears to y the ancestral of the relation R just if either x bears R to y or x bears R to some w that bears R to y, or x bears R to some w that bears R to some z that bears R to y or . . .)

Before we go any further, let us note that it is one question whether such treatments of identity can ever be made intelligible independently of the scheme that they are supposed to supplant. (Can one really characterize the relation R independently of one's diachronic understanding of what a man is, independently, that is, of one's understanding of the relevant principle of activity and so on? It seems perfectly extraordinary that so many philosophers should be happy simply to *assume* this.) It is another question whether such a treatment is mandatory and that is the question we are now concerned with.

David Lewis, the most distinguished among active champions of the constructionalist view, writes:

> The principal and decisive objection against endurance as an account of the persistence of ordinary things such as people . . . is the problem of intrinsic [properties].

Explanation: metaphysicians such as Lewis wish to distinguish intrinsic properties, which things have in virtue of the way they themselves are, from extrinsic properties, which things have in virtue of their relations or lack of relations to other things. (It is far from certain whether this distinction can be satisfyingly made out. But the question does not need to be disputed here.)

> Persisting things change their intrinsic properties, for instance shape: when I sit, I have a bent shape; when I stand, I have a straightened shape. Both shapes are intrinsic properties: I have them only some of the time. How is such change possible? First solution: contrary to what we might think, shapes are not genuine properties. They are disguised relations which an enduring thing may bear to times. One and the same enduring thing may bear the bent-shape relation to some times and the straight-shape relation to others. And likewise for all other temporary intrinsic [properties]; all of them must be reinterpreted as relations that something with an absolutely unchanging intrinsic nature bears to different times . . . This is simply incredible if we are speaking of the persistence of ordinary things . . . If we know what shape is, we know that it is a property, not a relation.

The conclusion to which Lewis himself comes on the basis of this difficulty is a striking one, namely the solution that people and other continuants do not endure but 'perdure': they are made up of temporal parts, which parts can have intrinsic properties such as a bent shape or a straight shape but do not last through changes in intrinsic properties. The question of identity through change is transformed into the question whether distinct but putatively related items belong to a unitary but more complex thing, a certain complex or sum of temporal parts.

Lewis takes the problem of temporary intrinsic properties exceedingly seriously then. What would Aristotle have said about it? He might have said (cf. *De Interpretatione* 16^a14–18) that it was all very well to represent these supposedly troublesome claims in the fashion of modern logicians as

> Bent, t_1 (David).
> Straight, t_2 (David).
> Sit, t_1 (David).
> Stand, t_2 (David).

Such renderings are perfectly neutral between all accounts of the matter, he might have said: but, if we use these renderings, we must ask what makes these strings into sentences. As Aristotle said

> Names and verbs just by themselves—for instance [*bent*, *straight*, *stands*, *sits*, *David*] when nothing further is added—are like the thoughts that are without combination or separation. For, just by themselves, such strings are neither true nor false . . . unless 'is' or 'is not', either simply or with reference to some time, is added [or unless a finite verb-ending is supplied, as in 'David sits' or 'David stands'].

In other words, the renderings of sentences that are given by first-order logic will assign to bare concatenation the work of natural language devices like the copula 'is' or verb-endings ('stand' + 's' etc.). There is nothing wrong with that, so long as we remember that the copula was the locus of time indication, modality, negation, etc. Once we remember that in the sentence 'Bent, t_1 (David)', the 't_1' goes with an 'is' that has been suppressed, we can see that being bent is indeed a property a person *has* at a time. Being bent then is not a relation between a person and a time. Nor need symbolic logic set any store by insisting that it is a relation. (On these and related matters, the reader may wish to read the paper by Mark Johnston cited in the Bibliography. Aristotle's position anticipates Johnston's.)

4.11. Aristotle's Further Thoughts

4.11.1. In *Categories*, Aristotle provided most or all of what we really need in order not to misunderstand our own thoughts about change and to escape the

idea that change stands in need of philosophical reconstruction. But in his subsequent writings he aspired to do more than this. He wanted to give a positive answer to Parmenides' doubts about change and to build upon this answer a more ambitious philosophical account of substances, the so-called hylomorphic account, which is presented in the *Metaphysics*. Within this account, the ordinary substances of *Categories* come to be seen as compounds of matter and form and there is a settled tendency for the title of true substance to be taken from ordinary things such as Socrates, seen now as a compound of matter and a form, and transferred to forms actualized in matter (entelechies), where the *form* of Socrates either is or is correlative with the *essence*. (In Aristotle's technical language, the essence of Socrates is 'what being is for Socrates'.) The form is that which makes Socrates the this something that he is. Or in another remarkable turn of Aristotelian philosophical speech, it is *the substance* of Socrates (see *Metaphysics* $1017^{a}22$, $1038^{b}10$) and that which remains constant throughout all the changes which Socrates undergoes. (It may help to keep in mind the question whether in 'the substance *of* Socrates' one is to take the 'of' as like the of in 'the body of Socrates' or 'the hand of Socrates' or as like the appositive 'of' in 'the city of Paris'. In the latter case, the substance of Socrates would be just Socrates, the *real* Socrates.)

These developments have given endless trouble. If we had aimed at a more complete or fair account of all the philosophical problems that critics have found in the idea of substance, then we could not have waited so long to do what must now be attempted, however briefly. This is to paint into the picture so far presented some of these later Aristotelian details, to note their effect, and then, for purposes of the final, updated defence of the idea of substance, to consider in each case whether or not to retain the new detail.

The reader should be warned that, on the view to be submitted here for consideration, few if any of Aristotle's emendations or additions (even the most interestingly reasoned) will count as straightforward improvements.

4.11.2. Advancing into the philosophy of nature from what he called dialectic (and we might call the philosophy of logic or language), that is from the philosophical pursuits of the *Categories* and other logical writings, Aristotle had confronted the Eleatic denial of change. He had summed up their attack upon change in the question 'How can what is come to be from what is not?' His response in book 1 of the *Physics* had come down to this: in the course of a normal or non-substantial change, a change like the becoming sunburnt of a white man, for instance, or the becoming educated of an ignorant one, we do not have the coming to be of something from nothing. We have the coming to be sunburnt of something that is there throughout, namely that which was first white and then sunburnt. Aristotle claimed that all change (all non-substantial

change, rather) involved a change between two contrary attributes and involved a subject, the subject being that which first has the one attribute and then has the other. This is not something's coming from nothing.

So far so good. The *hupokeimenon*, or underlying thing, in this case is simply the subject or substance itself. There is no need to talk of matter—except in so far as we are already impressed by the materiality and mutual displacing tendencies of ordinary substances (which are not points specifically requiring hylomorphism for their statement). But what about the other case of change, substantial change, the kind of change where something new comes into existence, as happens with the generation of an animal or a plant? Here too Aristotle had wanted to insist that this is not a case of something's coming to be from nothing, but a case of something's coming to be from something that is always underlying, namely matter, the matter first lacking and then acquiring a certain structure or form. 'By matter I mean the first *hupokeimenon* (subject/substratum) of each thing, that from whose presence something arises non-accidentally' (192ª30–3).

Aristotle's only pretext for using the word 'hupokeimenon' in such a place—hitherto meaning 'subject', not anything covertly underlying, but now suggesting something possibly covertly underlying—was the analogy between non-substantial and substantial change that Parmenides' denial of change had forced him to postulate. That analogy is surely both strained and troublesome, however. It is not just that the matter from which a thing is generated may be lost and need supplementation in the process. It is not just that the way in which Socrates pre-exists and persists through sunburning is very unlike the way in which a seed plus that which the germinating of that seed sucks up from the environment pre-exists and persists (in so far as it does) through generation. The whole argumentative strategy is completely misguided.

All that Aristotle needs to say to Parmenides (as Aristotle reads him) is this: you deny change by asking how anything can come to be from nothing. Most change, where something comes to be ϕ, having previously been not ϕ, carries no semblance at all of involving this. But even in the case where a change is a coming into being of something that previously did not exist, the only thing that could pose any philosophical or dialectical difficulty would be such a thing's coming to pass inexplicably or without any reason—lawlessly, that is. There is simply no ground to think that the coming into being of a new thing is inherently inexplicable or lawless, however. As things are, the availability of matter helps to render intelligible the generation of substances. But intelligibility is the only issue and one might wonder whether there is anything *incoherent* in the idea as such of the creation of new matter or the destruction of old. (When early physicists postulated the conservation of matter, what they had got hold of was surely a place-holder for a much more abstract kind of conservation law. Why should the creation or destruction of matter offend against that

more abstract law or be *inherently* lawless?) Even at the level of its ultimate constituents, what is the incoherence in the idea that the world could be made anew every day?

These questions are not easy to debate against the background of Aristotle's conception of matter, which permits any kind of matter to become any other kind of matter. Letting them pass, we should note a more straightforward point. However things may stand with the question of the generation or destruction of the ultimate constituents of the world, there seems to be no incoherence in the idea that at that level and/or higher levels, everything could be in a steady state of incessant flux. In so far as there appears to be any difficulty in this, the appearance of difficulty arises from confusing flux with chaos. Consider the river in Heraclitus' fragments 12 and 91: 'Upon those who step into the same rivers different and again different waters flow. The waters scatter and gather, come together and flow away, approach and depart.' The river is in constant flux. The waters are constantly renewed. We may even suppose that, consequentially upon this changing of constituents, the river changes in any and every property range, in depth, strength, speed, temperature, colour, noise-level, etc. These changes, however extreme, need not be lawless. Nor, incidentally, do they prevent us from singling out one and the same river. To say that the river is changing constantly in every respect is not to say that it is changing in respect of being a river. Rather, that is precisely *not* a respect in which the constantly changing river changes, even under condition of total flux. (The only thing we need in order to make sense of this last point is to see it as an application of the familiar distinction between what a thing is like and what the thing is.) But in that case there is no sound analogy between the way in which an enduring subject undergoes qualitative change and the way in which matter underlies substantial change.

4.11.3. So much for Aristotle's introduction of matter, an introduction grounded in an unwise and unnecessary concession to the Eleatics. The next speculative leap is briefly recorded in Aristotle's philosophical lexicon, namely *Metaphysics*, book 5 (Δ), where he anticipates the conclusions of books 7 (Z) and 8 H about what a substance is by saying that substance, *ousia*, can mean 'either [as in *Categories*] (1) the final subject/substratum which is not predicated of other things or else (2) that which is a "this" and separable: of this nature is the shape [*morphē*] of anything or the form [*eidos*, the same word as Plato had used for Platonic Form and Aristotle himself had used for species]' (1017^b23–5). As we have said already in Section 4.11.1, the second understanding of *ousia* that Aristotle mentions here scarcely differentiates the substance of a thing from the essence of a thing. 'The essence, the formula of which is a definition, is also called the substance of each thing' (1017^b21; cf. 1028^b15–18). But this is a

conclusion that gives notorious trouble to Aristotle and then to his interpreters. (See Z, chapter 13.) Such an essence seems too much akin to a universal, too much akin to something multiply instantiable, that is, for it to be a true substance.

Has not something gone badly wrong—the same thing that has gone astray when a philosopher is visited by the temptation to add into English the absurd expression 'thisness'? Perhaps one should reflect at this point that there can hardly be a general answer to the question 'What is the substance of *x*?', because the answer must be different in each case. If the answer is different in each case, should Aristotle even be asking the question? Or, rather, should he be interpreting the question what a substance is in such a way that an answer to it must confront that question?

Well, perhaps it is all right for him to allow his inquiry to generate such a question if there is some prospect of finding a universal schema that generates or otherwise informs the varying answers that apply in each particular case. If there is such a schema to be found, then Aristotle will surely insist that it relates to the hylomorphic paradigm of matter and form. The strange thing about Aristotle's use of that paradigm, however, is that he should have been led by it to promote form not only over matter, but also over the compound of which the form is 'the substance'.

4.11.4. Let us focus on the first moves by which Aristotle advances in the direction of his conclusion that substance is form and his idea that there is something that is the substance of *x*, which is its 'shape' or its form or 'the plan of the form'.

In Z. 3, having enumerated as candidates to be substance (1) the essence, (2) the universal, (3) the genus, (4) the subject/substrate or ultimate subject, Aristotle then subdivides (4) in accordance with the matter–form scheme brought forward from *Physics* 1, saying that subject/substrate or ultimate subject is that of which other things are predicated, while it is not itself predicated of anything else.

> Hence we must first determine its nature, for the first subject/substrate is considered to be in the truest sense substance. [Cf. *Categories*.] Now in one sense we call the matter the substrate/subject, in another the shape, and in a third sense the compound of these. By the matter I mean, for instance, the bronze, by the shape the plan of the form, and by the compound of these (the concrete thing), the statue. *Therefore if the form is prior to matter and more real, it will be prior to the compound also for the same reason.* (1029^{a}1 f.)

In the sentence italicized, we see one part of the supposed rationale for shifting attention away from what counted as a primary substance in the *Categories* and towards form. On the supposition that being not itself predicated but having other things predicated of it is the mark of substancehood, the candidacy of

matter leads us to something that cannot even be a this, or separable, or individual. If matter were substance, then we should expect that there would be an answer *f* to the question what such-and-such matter was, and we should expect that, holding *f* constant, we could treat everything besides being *f* as inessential to that particular substance. (Here see our comments at Section 4.8.1 upon Leibniz, *New Essays*, II. xxiii. 2.) But, measured by this test, matter fails completely to furnish anything that is a 'this' or separable. (What does matter have to be in order to count as matter, or as that matter?) One misconceives matter by thinking of it even as a candidate to furnish anything to play the role of a substance.

From this Aristotle concludes that, since matter cannot be substance, it is form that must be substance. For as regards the other candidate, namely the 'substance compounded of both matter and form, [it] must be dismissed. For it is posterior and its nature is obvious . . . We must inquire into the third kind of substance [namely form]: for this is most difficult.' It is from here that the path leads on to essence and the troublesome conclusions already mentioned. At this crucial point we need more detail, however, in order to appraise what is going on.

4.11.5. Let it be clear that Aristotle has not simply abandoned the items that were called in *Categories* primary substances. They will have their proper place in the full theory, if the full theory does what it is meant to do: but the introduction of the new scheme of matter and form has had the effect of depriving the primary substances of *Categories* when seen as compounds of their previously undisputed title to being regarded as the substances *par excellence*.

The text of the argument I have reported in the paragraph before last against the claims of matter to be a substance reads as follows (with interpretative intercalations in square brackets):

> Substance is not that which is predicated but that of which other things are predicated. But it is not enough to make this ruling [which we proposed in *Categories*]. For it is unclear and one of its apparent effects is to make matter into substance. [For matter, once we introduce it into our ontology, becomes the final subject/substrate.] If matter is not [by the terms of this ruling] substance then we cannot say what other substance there is.
>
> Suppose we take away from matter [considered as candidate to be substance] everything else [everything else but its supposed substance *qua* matter, this what-the-matter-is being held constant while we imagine everything else being varied]. Then nothing at all remains. [For in the case of matter there is no what-it-is to hold constant.] What is removed in this thought-experiment will comprise all the affections, the products and the capacities of matter. The [remaining] length, breadth and depth of matter are simply the quantities or dimensions of matter. Mere quantity or dimension does not give us the substance of matter [or what the matter is]. The substance [if matter were

substance] would have to be that to which the quantity or dimension belonged. When we take away [from matter] length, breadth, depth etc., we find nothing left over except that which is bounded by them, in which case matter [in the sense of what *has* the length, breadth, and depth] will appear to be the only substance.

This is a conclusion Aristotle is going to say that he finds absurd and impossible, on the grounds (1029ª27–9) that matter so conceived cannot be singled out as 'this' and 'it is accepted that separability and being a "this" belong especially to substance'. It is this absurdity that opens the way, as we have said, to the candidature of form; it is from this point on that Aristotle sees form as offering better prospects for separability and being a this, and treats separability and being 'this' as better indicators of substancehood than not being predicable. But in the *Metaphysics* as we have it (not a finished work but lecture notes, interspersed perhaps with other notes and memoranda), before he gives his grounds for finding the candidature of matter absurd, a passage intervenes that has given endless trouble over the ages:

By matter I mean that which *in itself* is neither some particular thing nor a quantity nor anything else that belongs in one of the other categories of being. For there is something of which each of these [including primary substances such as Socrates or Arkle] is predicated. Its being is different from that of the things predicated of it. For all the other things are predicated of a substance, but substance itself is predicated of this. So that ultimate [substance/substrate] is in itself neither some thing nor some quantity nor anything else. Nor indeed is it the negative of any of these things. For these too would apply to it only as accidents.

Coming where it does in Aristotle's discussion, this passage will probably remind the reader of Locke's something-we-know-not-what account of substance and lead him to question the stand that has been taken here to distance Aristotelian substance from the Lockean we-know-not-what. But, even if something almost equally lamentable is in train, what is going on here is importantly different.

Note first that what we find in this passage is precisely not Aristotle's account of substance. It is an account of matter. But nor is matter here matter as Aristotle normally thinks of matter. (Examples of that would be wine, bronze, earth.) Nor yet is matter in this passage matter as Aristotle defined it in the *Physics*. ('By matter I mean the first subject/substrate from whose presence something arises non-accidentally', already quoted. Nothing at all could answer to this description if it had no properties that made it the right matter for that which arose from it.)

If the Z. 3 conception of matter is special in these ways, why is it special? It is special because it arises from three suppositions that are local to the dialectical context—namely, the assumption (1) (to be tested here, supposedly to destruction) that substancehood is equivalent to ultimate non-predicability; the sup-

position (2) that only what is predicated of a substance substantially is really a property of it—a supposition that can be relied upon to give amazing results where the subject is something like matter and matter is thought not to admit any real (or what-it-is-type) predications; the supposition (3), which hylomorphism seems to import, that if the man Socrates is a compound (a compound of flesh and bones and the form of man), then Socrates and/or man are predicated of the flesh and bones.

This explains why the Z. 3 account of matter is so strange. But what is one to think of the steps by which Aristotle reaches his conclusion? Well, there is no point in denying that (2) may have arisen from a trend of thought similar to that which leads into the seductive but absurd proposition mentioned at the beginning of the penultimate paragraph of Section 4.8.1 above. But far more important than that mistake—a dead end leading to no Aristotelian conclusion not otherwise available—is the fact that supposition (3) is false. To see why it is false, consider ordinary predication. If Socrates is a man, then there is a man whom Socrates is identical with and with whom he shares all properties. This is an entirely general point about predication, not to be confused with the silly aspiration to reduce all predications to identities. (To test it, try another kind of predication. If Socrates is white, then Socrates is identical with some white thing and he shares all his properties with that.) Now suppose we try saying that the flesh and bones is Socrates. On a proper understanding of what is being said, that does not mean that Socrates shares all properties with the flesh and bones. The flesh and bones does not sit or talk. And Socrates predeceases the flesh and bones. 'This flesh and bones is Socrates' is misleading. What it really means is that this flesh and bones *makes up* or *constitutes* Socrates. What is predicated of the flesh and bones is not Socrates or man but the property of constituting Socrates or constituting a man. If hylomorphism entails (3), then so much the worse for hylomorphism.

4.12. Complaints about Aristotle's Further Thoughts

4.12.1. What follows? It follows that there was never any real danger of matter's counting as the ultimate subject. More importantly, the whole case against the *Categories* criterion of substancehood and against Aristotle's election in that work of Socrates, Arkle, Victor, etc. to be the first substances simply collapses. (It also means that there is no connection between ultimate subjecthood and the kind of ultimacy with which physics is concerned.) In so far as hylomorphism rests on a denial of the *Categories* doctrine (rather than hylomorphism's being an idea to be worked out in the progressive reconciliation with Aristotle's earlier views that I believe some readers want to find in the succeeding books of the *Metaphysics*), well, hylomorphism was simply a mistake.

But what mistake? Does it have to be a mistake? Let us go back now to the

very idea, presumably definitive of hylomorphism, that a substance such as Socrates is a compound of matter and form. Socrates is 'this in that', Aristotle says—this sort of thing, namely man, in that sort of matter, namely flesh and bones. To understand such claims it is important to see that making them is utterly unlike saying that bronze is copper mixed with lead, and very unlike saying that a hammer is a stick of wood (the handle) attached to a piece of iron (the head). To say that Aristotelian form and matter are utterly different sorts of thing is not simply to say that they are very different *components*. The form is not a component at all. It is that which corresponds in the thing to a true statement of 'the shape' or 'the plan of the form'.

These points are philosophical reminders for ourselves. They are not yet criticisms of Aristotle, who attained to a state of incomparably subtle awareness of these and kindred matters—not least the difficulty of characterizing the form of a perceptible substance independently of the requirements upon its realization in matter (how to say what a man is without reference to his embodiment?) and the difficulty of characterizing a substance's matter in a manner independent of all reference to the form that it is to realize. (How to say how matter must be for it to realize man? Flesh and bones presuppose animal. What is more, not any old flesh and bones will suffice. We need the right sort of flesh and bones for a man in particular.) The question is how to follow these insights through into a simple or soundly based philosophy of substance that might still serve as a part of a sane philosophy.

At 1029^{a}1 f., already quoted, Aristotle says 'If form is prior to matter and more real it will be prior to the compound also, for the same reason.' We have more or less allowed Aristotle, if not his exact argument, then at least the conclusion that matter is a poor candidate to furnish a substance or a this. Maybe we could also allow him the claim that, if the issue is how to arrive at a 'this', form is a better candidate than matter. But can we allow it to him that the form is prior to the compound of form and matter and therefore a better candidate than the compound for being a substance? The sense of priority that is to be understood here is a matter of debate among scholars. But it seems certain that, whatever its intended sense, it is a necessary condition of such a contention's being correct, and of Aristotle's being right to transpose his search for substance to the level of form, that hylomorphism should progress to the point where the form of Socrates should be specifiable and specifiable independently of the identification of Socrates himself (and of things that are like Socrates in being men).

Can Aristotle meet this requirement? Can Aristotle advance beyond this claim:

Socrates = the form of man in such-and-such matter?

By a pseudo-algebraic conversion, it might be suggested we can progress from this to

the form of man = Socrates without (or in abstraction from) such-and-such matter.

But, even if this be held to make sense, Aristotle cannot 'solve' the equation for *form* until a value is supplied for 'such-and-such matter'. Indeed Aristotle's heightened awareness of the points mooted in the paragraph before last would have forewarned him of the extraordinary difficulty of solving it (as well as of making sense of it). To recognize the materiality of the things that he had designated primary substances in *Categories* and to think of matter as he does at *Physics* $192^{b}30$–3 (already quoted) will not yet supply the equation with an independent fix upon 'such-and-such matter'. So where the specification of form is concerned, the would-be equation does not advance him beyond what he knew about the secondary substances that he spoke of in *Categories* or beyond the species (the *eidos* as Aristotle had first conceived of it). But this was something universal, multiply instantiable, and all the rest. Meanwhile, before the equation is solved for 'form', the matter of a thing can only be conceived of by abstraction from that thing. That is perfectly satisfactory for many purposes, but not for the purposes of metaphysical hylomorphism.

4.12.2. It is possible that, in defiance of Aristotle's teleological or final cause approach to biological questions, a molecular biologist might seek to supply the extra information that would be required to solve (if not to explicate) the 'equation' recently considered.

Faced with such a specification of the matter, a philosopher of substance might seek to revive and renew hylomorphism, no longer as metaphysics or metaphysical chemistry and biology—a funny business at the best of times—but as a scientific programme. He would then have to seek to adjudicate in an open-minded way the collision between biology as Aristotle conceived it in top-down fashion and the pretensions (perhaps inflated) of molecular biology to solve questions of organic development and the rest. It is unclear, however, that, transposing Aristotelian hylomorphism to this new key, a philosopher of substance ought to imitate Aristotle further in demoting 'compounds' such as Socrates or Arkle in favour of (what we might tendentiously call 'their own'!) forms or principles of biological organization. For these forms or principles are surely in principle multiply instantiable—as they are in the real-life case of twins, unless we distinguish the form of one twin from the form of the other twin by reference to the difference in the histories of the two twins. But then the primary substances or 'compounds', one twin and the other, play an indispensable part in the individuation of their forms, contrary to the claim that the forms are prior to the 'compounds'.

The questions that still remain here are at least as obscure as the question that we have postponed so often, namely that of the philosophical significance of the

idea of a substance. What point is there in having a notion of substance that is more than the notion of a material body—or more than the notion of matter at a moment?

4.13. What is at Issue when we Ask whether Something is a Substance?

4.13.1. Let us find our way back to questions of this sort by considering things that have often been treated as (at best) marginal candidates for the full status of substances (have even been treated as marginal by philosophers like Aristotle who made constant use of them as examples), namely artefacts. Why should one doubt the proper substantiality of artefacts?

The grounds for doubt would run as follows: We claimed in Section 4.4.1, Section 4.5.1 (the last paragraph but one), and Section 4.10.1 that the singling-out of a thing at a time *t* reaches backwards and forwards to points arbitrarily much earlier or later than *t* at which that same thing exists. If so, then the way in which we have to conceive of kinds of artefact in singling them out will force us to think of artefacts of a given kind both *diachronically* and *by reference to the function that defines their kind*. How that function is to be conceived does not depend on something out there in nature that could further saturate our thoughts about clocks or chisels or houses or bicycles or fishing-rods. It is up to us (us collectively) how to conceive of it. Nor again is it sensible to expect there to be any such thing as the natural development of a clock by which the question of identity and persistence might be judged. In the third place, even though artefacts are themselves things out there in nature and in no way exempt from the laws of nature (indeed artefacts represent the exploitation and application of those laws), it will be silly to expect the sorts *house*, *bicycle*, or *clock* to figure in rich open-ended sets of sort–property pairs that are well-made for inductive extrapolation across the whole kinds that they determine. Contrast what was said in Section 4.5.1 about genuine substances. Indeed, being variously constructed out of various materials and working by various different mechanisms, clocks need have little in common with one another, over and above being things designed to tell the time. Even if we subdivide clocks into subvarieties, it may be hard to see that the activity of any particular clock need amount to much more than its doing what it must do to tell the time. Little else can flow from the fact that it is this or that device, deliberately designed to tell the time. Finally, if artefacts are natural substances as well as being artefacts, then artefact kinds and natural kinds will have to cross-classify substances, contrary to Aristotle's desiderata. (See the last two sentences of Section 4.4.1.)

Such might be the grounds for the doubt. The doubt rests on an undeniable difference between artefacts and the cases that we began with, where the sense of the sortal term under which we pick out an individual expands into the sci-

entific account of things of that kind (see Section 4.9.1), where that account first clarifies what is at issue in questions of the sameness and difference of specimens of that kind and then assists in their resolution. (See Sections 4.3.3, 4.4.1 (end), 4.5.1 (end).)

It follows that there is a temptation to maintain the purity of the original conception of substance. This temptation is only strengthened by the intractability of some of the other questions in which artefacts involve us (especially questions of identity and difference). Yet the solidity, durability, and internal cohesiveness of a vast preponderance of our artefacts, some of them outlasting their makers (who certainly were substances) by millennia, would be a standing reproach to any would-be puristic ruling to the effect that artefacts stand at too great a distance from the natural continuants that furnished us with our original paradigm of substance. Indeed such a ruling would represent in at least one way an affront to the spirit of the original conception. For not only do artefacts submit to predication without being predicated, not only can they furnish us with a 'this' and furnish (in so far as we know what this means) something 'separable'. Their usefulness and effectiveness in the performance of their functions signals and celebrates the very same evolving understanding of the way ordinary perceptible things behave that made the notions of substance, of nature, and of substances with their natures so interesting and important to us in the first place.

At the outset it was suggested that the notion of a substance is the notion of something persisting, basic, endowed with a nature, something possessing claims to be recognized for a real thing which are claims on our aspiration to make practical and theoretical sense of the world. Hence the indispensability of the notion of substance to the rationalists, who expected nothing to hold true but that there be a reason for its holding true and who expected the world to conform in every particular to transparent reason as they thought they understood that. But hence too the sense of dislocation that would result from our withholding the status of substance from all artefacts. For artefacts are contrived to exploit, often by interaction with substances, that low-level, dependable, indispensable understanding in whose name we engage in the individuation and articulation of the natural substances that are Aristotle's original exemplars.

4.13.2. But do we know what we are arguing about here? It will relax the intellectual cramp that threatens if, instead of trying to decide the question whether artefacts as a class are or are not substances, we resolve to reinterpret the question and see it as a question about the *distance* at which this or that particular artefact (or this or that group of artefacts) lies from the central case, in respect of durability, internal cohesiveness, having a relatively self-contained principle of activity, and exemplifying some simple law of change.

The reader will now try asking why we do not go the whole way and allow the title of substance to any and every material body, however short-lived or gerrymandered. It is not as if some bodies exemplify better than others the fundamental physical laws of nature. All bodies are equally subject to those laws.

The question is fundamental to the philosophy of substance. And here is the place where we have to acknowledge the wide chasm that lies between our outlook and the outlook of a philosopher like Aristotle, for whom the best insight into the nature of reality was that afforded by the final causality exemplified by living things, or the outlook of a philosopher like Leibniz, for whom the ultimate reality was a mental reality of simple partless soul-like substances on which the whole physical world depended or supervened (see Leibniz's letter to De Volder, quoted in Section 4.6.1 above). One with our outlook will tend, however mindlessly, to assume an opposite dependence or a dependence of the macroscopic on the microscopic. For us, the importance of the category of substance, if it has any importance, is not so much ontological as relative to our epistemological circumstances and the conditions under which we have to undertake inquiry. These circumstances and conditions determine where we have to begin in order to find our way about, in order to designate spatial and temporal landmarks, and in order to find workable, dependable, low-grade generalizations about how identifiable classes of things come into being, persist, and behave. Objects of these kinds are special and important and important by virtue of things about the human condition that will not change. But the considerations that make them important in this way cannot help but pull apart from the question of the ultimate physical reality that is to be revealed by the forward advance of the sciences of matter. (See Sections 4.3.1 (end), 4.3.2 (beginning), 4.3.2 (end), 4.11.5 (end), 4.12.1 (beginning).)

For us then the question that is at stake when we ask what counts as a substance cannot be momentous in the way in which it is momentous for Leibniz or Aristotle. Yet in so far as we take ourselves to be substances (and continue to find a Humean idea of the self unsustainable in practice, as Hume himself did in his ethical writing), the question is not one that simply disappears. It will never disappear, even though it can only regain its full or earlier significance if we are carried by the conviction of our own substancehood to the point of reasserting *something* of the autonomy of substance. (Such a declaration, however welcome it might be to the present author, would signal rather more than a mere change in intellectual fashion.)

4.13.3. Artefacts are not the only objects that challenge reflection. In the chapter of *New Essays* succeeding the one from which we have quoted already, we find in Bennett and Remnant's translation of II. xxiv. 1:

PHILALETHES. After simple substance, let us look at collective ideas. Is not the idea of such a collection of men as make an army as much one idea as the idea of a man?

THEOPHILUS. It is right to say that this aggregate makes up a single idea, although strictly speaking such a collection of substance does not really constitute a true substance. It is something resultant, which is given its final touch of unity by the soul's thought and perception. However it can be said to be something substantial, in a way, namely as containing substances.

There are substances, we have said, that we have no choice but to recognize. Their claim is a claim on our practical and theoretical reason. Everything conspires to force them upon us if we have the slightest concern to find our way about the world or understand anything at all about how it works. We can concur with Leibniz in his conclusion (if not in his special route to that conclusion) that human beings, animals, and other continuants rank high among such things. But these are not all of the things that we can identify or single out or that enter into the ways in which we make sense of what happens in the world.

Suppose a large body of men is moving across the countryside, billeting itself upon the inhabitants and commandeering their goods and services, advancing slowly but manifestly enough in some common direction. The best way of making sense of their activities may seem to be to see these men not just as individuals pursuing their own largely rapacious concerns but as men acting in ways answerable to the centralized authority of a commander. If the army the men belong to is an impressively cohesive and disciplined instrument of political will, then it may seem almost mandatory to one who observes the soldiers to 'give the final touch to the unity' of the aggregate entity that they collectively constitute. The observer may find it almost impossible not to see in the presence of the soldiers the presence of that to which they belong—at least until such time as indiscipline or the tendencies of individual soldiers to defect or disregard authority shatter (if they do) all sense of the presence of a larger thing with its own dependable principle of activity and its own way of conducting itself. Is an army then a substance?

Similar questions will arise with the ontological and explanatory claims of other corporate entities such as states, civic associations, clubs, companies, trusts, banks, and other 'legal persons', or with cabinets, committees, boards of management, and the rest, or with clans or nations or families. There are so many things that we want to say that seem to make ineliminable reference to such things. (Another quite different set of questions arises if someone asks whether God is a substance.)

Let us distinguish here two questions. (1) Can we adequately describe reality without making mention of these things? (Can we find a recipe to translate every apparent indispensable truth about armies or nations or states into another truth that lacks such existential commitments? This will normally involve us in finding predicates coextensive with the predicates that occur in the

sentences to be reduced and in other potentially troublesome tasks not to be lightly undertaken.) (2) Are the entities in question sufficiently like our paradigms of substances to count as having any claim to substantiality? Do they tend to extrude one another from a given place or can two of them be in the same place at the same time? How important is that? Are there low-grade laws about how they behave? A negative answer under (2) will not commit the answerer to any particular answer to (1). But then, pending our retreat to some of the assumptions of earlier philosophical epochs, it will not be sensible to feel that we have to find conclusive arguments here. Nor do we need to cling to those assumptions in order to hold on to Aristotle's cleverly commonsensical understanding of the relation between a subject and its various properties or qualities.

BIBLIOGRAPHY

CAUSATION

The best collection of readings on causation is: Ernest Sosa and Michael Tooley (eds.), *Causation* (Oxford, 1993), referred to below as 'Sosa and Tooley'. There is no decent introductory full-length book on causation, though David Owens, *Causes and Coincidences* (Cambridge, 1992) presents a novel theory of causation in a very readable, clear way, and contains interesting discussions of some of the theories mentioned in this chapter.

Hume's view of causation, see *A Treatise of Human Nature*, I. iv, and *An Enquiry Concerning Human Understanding*, ch. 7. A good introductory book on Hume is David Pears, *Hume's System* (Oxford, 1990). Recently, a number of writers have argued, against the standard interpretation of Hume, that Hume did think that there is a causal relation in nature: see Galen Strawson, *The Secret Connexion* (Oxford, 1989).

For arguments that regularity is not necessary for causation, see G. E. M. Anscombe, 'Causality and Determination', in Sosa and Tooley. See also C. J. Ducasse, 'On the Nature and Observability of the Causal Relation', in Sosa and Tooley.

For conditionals and the counterfactual theory see J. L. Mackie's paper 'Causes and Conditions', in Sosa and Tooley, which expounds the INUS condition view of causation. See also his paper 'A Conditional Analysis of the Concept of Causation', in Ted Honderich and Myles Burnyeat (eds.), *Philosophy as it Is* (Harmondsworth, 1979). Mackie's views are criticized by Jaegwon Kim, 'Causes and Events: Mackie on Causation', in Sosa and Tooley. The counterfactual theory is presented by David Lewis, 'Causation', in Sosa and Tooley. For the general idea of a counterfactual conditional see Lewis, *Counterfactuals* (Oxford, 1973). Lewis presents his theory of causal explanation in 'Causal Explanation', in *Philosophical Papers*, i (Oxford, 1986). Lewis's views are discussed by Jaegwon Kim, 'Causes and Counterfactuals', in Sosa and Tooley. More difficult is Jonathan Bennett, 'Event Causation: The Counterfactual Analysis', in Sosa and Tooley.

Concerning the relata of causation, Davidson's theory that causes and effects are

events is outlined and defended in a classic paper: Donald Davidson, 'Causal Relations', in Sosa and Tooley. The alternative view, that causation relates facts, is argued for by D. H. Mellor, 'The Singularly Affecting Facts of Causation', in *Matters of Metaphysics* (Cambridge, 1991). Mellor's collection also contains a number of other important papers on causation, notably 'On Raising the Chances of Effects'. These are both quite difficult, but well worth the effort. For another perspective, see Jaegwon Kim, 'Causation, Nomic Subsumption and the Concept of Event', *Journal of Philosophy*,70 (1973), 217–36, and Jonathan Bennett, *Events and their Names* (Cambridge, 1988).

TIME

An excellent collection of readings on the philosophy of time is Robin Lé Poidevin and Murray MacBeath (eds.), *The Philosophy of Time* (Oxford, 1993), referred to below as 'Le Poidevin and MacBeath'. This is well worth buying; it contains some of the essential readings on the topics dealt with in this section. Another collection, of more variable quality, which includes articles by physicists and mathematicians, is Raymond Flood and Michael Lockwood (eds.), *The Nature of Time* (Oxford, 1986). Two excellent general books on time are D. H. Mellor, *Real Time* (Cambridge, 1980) (this also contains a good bibliography); and W. Newton-Smith, *The Structure of Time* (London, 1980).

For the passage of time, the essential reading is from Le Poidevin and MacBeath. McTaggart's argument is in J. M. E. McTaggart, 'The Unreality of Time', in Le Poidevin and MacBeath. This is responded to by A. N. Prior, 'Changes in Events and Changes in Things', in Le Poidevin and MacBeath, and D. H. Mellor, *Real Time* (Cambridge, 1980), ch. 6; repr. as 'The Unreality of Tense', in Le Poidevin and MacBeath. See also Michael Dummett, 'McTaggart's Argument for the Unreality of Time', in *Truth and Other Enigmas* (London, 1978), and Robin Le Poidevin, *Change, Cause and Contradiction* (Basingstoke, 1991).

On absolute and relational conceptions of time a very readable introduction is W. Newton-Smith, 'Space, Time and Space-Time: A Philosopher's View', in Raymond Flood and Michael Lockwood (eds.), *The Nature of Time* (Oxford, 1986). Newton-Smith's book *The Structure of Time* (London, 1980) is an excellent, clear investigation of these topics. Shoemaker's argument is from Sydney Shoemaker, 'Time without Change', in Le Poidevin and MacBeath. Lawrence Sklar, *Space, Time and Spacetime* (Berkeley, Calif., 1974) is a difficult but extremely interesting account of this issue, employing many of the concepts of contemporary physics.

On the direction of time, David Lewis's argument that time travel is possible is in 'The Paradoxes of Time Travel', in Le Poidevin and MacBeath. Other essential reading is D. H. Mellor, *Real Time* (Cambridge, 1980), chs. 9 and 10, and Michael Dummett, 'Bringing about the Past', in *Truth and Other Enigmas* (London, 1978).

UNIVERSALS

Unfortunately, there is very little good introductory material on this topic, and much of the best advanced reading is buried in obscure journals. A very good introduction,

from the point of view of a committed realist, is D. M. Armstrong, *Universals: An Opinionated Introduction* (Boulder, Colo., 1990). This summarizes some of the main lines of argument of Armstrong's two-volume study *Universals and Scientific Realism* (Cambridge, 1978); i: *Nominalism and Realism* is a critique of nominalism, and of the other theories which Armstrong rejects; ii: *A Theory of Universals* presents his positive account. Armstrong always writes clearly, though some of the arguments can be a little technical. A good collection of readings is M. J. Loux, *Universals and Particulars* (South Bend, Ind., 1976).

On the distinction between universals and particulars, the argument of Ramsey's mentioned in the text is in his difficult but rewarding paper 'On Universals', in *F. P. Ramsey: Philosophical Papers*, ed. D. H. Mellor (Cambridge, 1990). An excellent discussion of the nature of properties and their relation to causation is Sydney Shoemaker, 'Properties and Causality', in *Identity, Cause and Mind* (Cambridge, 1984). The relation between properties and predicates is discussed in D. H. Mellor, 'Properties and Predicates', in *Matters of Metaphysics* (Cambridge, 1991).

For the view that events are particulars, see Donald Davidson, 'Events as Particulars', in *Essays on Actions and Events* (Oxford, 1980). For the view that numbers are abstract objects, see Bob Hale, *Abstract Objects* (Oxford, 1988). For a good discussion of what 'abstract' means, see David Lewis, *The Plurality of Worlds* (Oxford, 1986), ch. 1.5. For the view that tropes, or so-called 'abstract particulars', should be considered as metaphysically fundamental, see Keith Campbell, *Abstract Particulars* (Oxford, 1986). These last three items are quite difficult reading.

Concerning nominalism, Locke's views on universals and particulars can be found in John Locke, *An Essay Concerning Human Understanding* (1690; Oxford, 1975). Various forms of nominalism are examined by Armstrong in *Nominalism and Realism* (details above). A prominent modern nominalist is Quine. See 'On What There Is', in *From a Logical Point of View* (Cambridge, Mass., 1953). See also Nelson Goodman, 'A World of Individuals', in *Problems and Projects* (Indianapolis, Ind., 1972) and David Lewis, *On the Plurality of Worlds* (Oxford, 1986), ch. 1.5.

Russell's argument against resemblance theories can be found in Bertrand Russell, *The Problems of Philosophy* (Oxford, 1912), ch. 9.

A good introduction to set theory is John Pollock, *Technical Methods in Philosophy* (Boulder, Colo., 1990).

Concerning realism, for Plato's theory of Forms, see his dialogues *Republic* and *Phaedo* in *The Collected Dialogues of Plato*, ed. E. Hamilton and H. Cairns (Princeton, NJ, 1961). Armstrong defends his realism in detail in *A Theory of Universals* (see above). Unfortunately, most of the criticisms of Armstrong are in academic journals.

SUBSTANCE

A general introduction to the idea of substance will be found in M. Ayers, *Locke*, 2 vols. (London, 1991), ii.

More Aristotelian general treatments will be found in: David Wiggins, *Sameness and Substance* (Oxford, 1980), 2nd edn. (Cambridge, 1996); G. E. L. Owen, 'Particular and General', in his *Logic, Science and Dialectic*, ed. M. Nussbaum (New York, 1985);

M. Frede, 'Substance in Aristotle's Metaphysics', in his *Essays in Ancient Philosophy* (Oxford, 1987):

These works presuppose some readiness to turn to the texts of Aristotle, especially to the first five chapters of Aristotle, *Categories*, trans. and ed. J. L. Ackrill (Oxford, 1974), and, much harder and far less indispensable, to all the chapters that are cited in 4.11.5 ff. from Aristotle's *Metaphysics*, book Z. The best and most helpful translation and commentary is in David Bostock, *Aristotle*: Metaphysics Z *and* H: *A Commentary and Translation* (Oxford, 1994).

An important Aristotelian point (alluded to in 4.10.1) about the substantives or sortal terms that stand for kinds of substance is transposed into modern idiom by P. F. Strawson, *Individuals* (London, 1959), part 2, and W. V. Quine, *Word and Object* (Cambridge, Mass., 1960), sect. 15.

The full reference to Leibniz's *New Essays* referred to and quoted in 4.7 (and elsewhere) is G. W. Leibniz, *New Essays Concerning Human Understanding*, trans. Jonathan Bennett and Peter Remnant (Cambridge, 1981).

Leibniz's 'Meditations on Knowledge, Truth and Ideas' will be found in G. W. Leibniz, *Die philosophischen Schriften*, ed. C. I. Gerhardt (Berlin, 1875–90), iv. 422–6. His essay 'On Nature itself or on the Inherent Force and Actions of Created Things' mentioned in 4.6.1 is at p. 505 of the same volume. The quotations (in 4.6.1) from Leibniz's letters to De Volder are drawn from the same text, ii. 263 and 278.

The citation from *Fourth Replies* of Descartes given in 4.6.1 will be discovered in *Œuvres de Descartes*, ed. C. Adam and P. Tannery (Paris, 1964), vii. 226.

Another text that fills out the history of the idea of substance is the first dialogue in N. Malebranche, *Dialogues on Metaphysics and on Religion*, trans. Morris Ginsberg (London, 1923).

An important article on John Locke's conception of substance is M. Ayers, 'Ideas of Power and Substance', *Philosophical Quarterly*, 25 (1975); revised for I. C. Tipton (ed.), *Locke on Human Understanding* (Oxford, 1977).

An important further article on Aristotle's theory of substance in his *Metaphysics* is by John Driscoll in Dominic O'Meara (ed.), *Studies in Aristotle* (Studies in Philosophy and in History of Philosophy, 9; Ann Arbor, Mich., 1981).

Hilary Putnam's article, mentioned in 4.9.1, 'Is Semantics Possible?', is in *Collected Papers* (Cambridge, 1975), ii.

In further pursuit of the outlook expressed by David Hume quoted in 4.2.1, the reader may wish to look at the remarks in B. A. W. Russell, *Outline of Philosophy* (London, 1927), 254–5, or to look up 'substance' in the index in B. A. W. Russell, *History of Western Philosophy* (London, 1961).

The paper by Mark Johnston cited in 4.10.1, is 'Is there a Problem about Persistence?'. *Proceedings of the Aristotelian Society*, supp. vol. 61 (1987), 107–55. This is a reply to the paper by David Lewis from which we quote in 4.10.1.