Time, Space, and Metaphysics

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For Matt

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Preface

Two major theories of time and space have divided philosophers and scientists over the centuries: the absolute conception of Newton and the relational theory of Leibniz. The debate between proponents of these views provides our starting point, and the framework in which much of the subsequent investigation takes place.

Metaphysics enters in two ways. First, the term may be used with respect to the investigation and analysis of concepts held to be indispensable to a description of fundamental and pervasive features of our world. *Time* and *space* are indisputably among such concepts, as also *change, identity, objectivity, memory, facts, causation*, and others which we shall encounter along the way. While most topics which might be expected to figure in a philosophical investigation of time and space receive some attention, our concern with more general questions falling under the heading of metaphysics leads us to range more widely.

Second, metaphysics often enjoys a more contentious status, being concerned with propositions and principles which are not merely basic to our ways of thinking, but which, while not recording logical truths, purport to transcend purely experiential knowledge. The very existence of a subject matter for metaphysics in this sense is a matter of dispute, and the observations we shall have occasion to make lend no weight to the view that this is a branch of philosophy with anything to offer, whether concerning time or others of the topics pursued. Rather, we shall find that, when metaphysics appears to beckon, what is called for is not an impossible discovery but a decision to adopt a particular mode of description, a decision to affirm or not to affirm the disputed propositions. With metaphysics in this sense in mind, I might equally have called the book 'Time, Space, and Nonsense', but not 'nonsense because unverifiable'. There is ample scope for speaking here of nonsense without tying meaningfulness to the possibility of verification. A related negative slant will be found in our diagnoses of depressingly familiar misconceptions, again with respect both to time and more generally, and where readers will possibly sense a lack of sympathy with current ways of thinking. They would be right. However, for the most part, the criticisms made are made less for themselves, more to prepare the way for a positive

resolution of the problems discussed, problems concerning the nature and reality of time and space, temporal order, temporal parts, verifiability, scepticism, anti-realism and the past, backwards causation, time travel, geometry, convention, the infinitude of space and time, and the possibility of time without change. While space as well as time is our concern, it is the latter that will receive the lion's share of attention.

The questions which concern us are questions which arise at an elementary level, and which do not require a knowledge of physics for their formulation. They persist, however, at more sophisticated levels, and I should like to think that the clarifications offered throw some light on the more esoteric issues which physical theory presents.

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Conceptions of Time and Space

Time is often perceived as having a dynamic quality, as something which moves and for which a stream provides a familiar, and a fitting, metaphor. Is it also, like a stream, to be thought of as a quantity in its own right, a quantity which exists side by side with events and changes, or is it just an aspect of such happenings, so that, when talking about time, we are simply talking in a more roundabout way about clocks, seasons, sunrises, and sunsets? Given that we may speak of having or not having enough time to do something, time must be a quantity of some kind, but does it compare with other quantities, as quantities of a gas or a liquid? A feature of these is that they qualify as *substances*. Not just substances in the ordinary sense of 'stuffs', but substances in the traditional philosophical sense of items enjoying an independent existence. For time, independence would mean independence of events or changes, such as the movements of the hands of a clock, a status which need owe nothing to such happenings or indeed to anything else which exists or takes place *in* time. On that conception, it is not that periods of time are ultimately determined by clocks or other regularities, but time is a self-sufficient quantity which clocks may, rightly or wrongly, measure or record.

1.1 ABSOLUTE AND RELATIONAL TIME

Two conceptions of time, the absolutist or substantivalist view of Isaac Newton and the relational or relative view of Gottfried Wilhelm Leibniz, can be distinguished by the answers which they give to these questions. Since the seventeenth century, western thought about time has been dominated by these conceptions, and much of our discussion will bear upon questions at issue in the debate between their past and present proponents. We shall begin with a brief sketch of what each involves.

According to Newton,

> Absolute, true, and mathematical time, in and of itself and of its own nature, without reference to anything external, flows uniformly and by another name is called duration. Relative, apparent, and common time is any sensible and external measure (precise or imprecise) of duration by means of motion; such a measure—for example, an hour, a day, a month, a year—is commonly used instead of true time.
>
> (Newton 1999: 408)

Absolute time equates to duration, and relative time is a measure of duration, and hence of absolute time. It is right to distinguish time as a measure and time as what is measured, but while the *concepts* may be different, a period of time may be both what measures and what is measured. So when we say that the task took a whole day, *day* serves to give a measure, but we may also determine the length of a day by making use of a timekeeper, in which case *day* serves to specify what is measured. In speaking of our sensible measure of time as being used *instead of* true time, Newton implies that true or absolute time itself provides a measure. However, it is not as if relative time were necessarily a rough and ready measure, since it is allowed that it can be precise—so, let us say, does not always have the variable character of a month or a year—in which case does it not then give the true time?

That is surely so, but relative time remains susceptible of variation and inaccuracy in a way that is excluded for absolute time:

> In astronomy, absolute time is distinguished from relative time by the equation of common time. For natural days, which are commonly considered equal for the purpose of measuring time, are actually unequal. Astronomers correct this inequality in order to measure celestial motions on the basis of a truer time. It is possible that there is no uniform motion by which time may have an exact measure. All motions can be accelerated and retarded, but the flow of absolute time cannot be changed. The duration or perseverance of the existence of things is the same, whether their motions are rapid or slow or null; accordingly, duration is rightly distinguished from its sensible measures and is gathered from them by means of an astronomical equation. Moreover, the need for using this equation in determining when phenomena occur is proved by experience with a pendulum clock and also by eclipses of the satellites of Jupiter.
>
> (Newton 1999: 410)

In this translation, 'equation' renders *aequationem*. The sense is better conveyed by replacing 'the equation of common time' by 'equating it with common time'. The constancy of absolute time is contrasted here with the

variability of relative time, these features being what is distinctive of each. Our various measures may not do justice to this constancy, days of relative time being liable to variation when set against days of absolute time. Absolute time is said to flow uniformly or equably (*aequabiliter*). What does that mean? Not to speed up or slow down, one might think, but that is a matter of the same amount of time passing in a given time, and, to ensure accuracy, what qualifies as the true time would surely have to be determined by absolute time itself, which leaves us with absolute time providing its own measure. Not only is it not clear that absolute time can be coherently enlisted to this end, but if absolute time is to furnish a measure, it would appear that it must be objectively divided, or at least divisible, into hours, seconds, and any other units we might happen to make use of. How could such divisions be effected in the absence of suitable periodic changes, as might be given by a clock, 'a measure of duration by means of motion'? The natural thought is that constancy or uniformity of time requires regularity of changes, rather than that changes are seen to be regular through their accord with absolute time, but for Newton that priority is reversed: even a perfect clock does not determine true time, but the dependence goes in the other direction, our clock having to be tested against true time and passing the test only if it is faithful to the equable or uniform flow which time in itself possesses. Intervals or periods of time require termini, temporal points, which we might again look to events to furnish, but Newton regards moments or instants of absolute time—'indivisible moments of duration'—as depending only on God, not on events (1999: 941).

We can perhaps extract a minimal absolutist thesis from the preceding passages to the effect that, whatever the variations and inaccuracies in our customary measures of time, there is such a thing as true time, in the sense of time which can be partitioned into objectively equal units or intervals. Whether this is correct, and whether it takes an absolutist conception to ground such equality, will be considered later. There is also controversy in the supposed possibility of time in the absence of change, a possibility which, while it does not figure in the initial characterization of absolute time, is sanctioned in the last passage: 'The duration or perseverance of the existence of things remains the same, whether the motions are swift or slow, or null'. It has been argued that Newton is misrepresented when it is said that he allows the possibility of a totally empty universe in which time none the less passes. However, while, given God's omnipresence, there can for Newton be no such universe, change does not come with the same inescapability.

The problem of explaining how true or absolute time has priority over relative time does not arise for the relationist account championed by Leibniz, and which was already to be glimpsed in Aristotle with his conception of time as the measure of change with respect to earlier and later (1984: 220[a]25). The relationist insists that time does not enjoy the independence accorded it by Newton, that in the absence of events and their relations it has no reality (Alexander 1956: 25–6). If there were no phenomena succeeding one another, there would be no time, time being, in Leibniz's view, nothing more than the order of succession among events. It is not: time makes change possible—as if time could be antecedent to change, a feature of the universe that rendered it fit for the occurrence of events. Rather, time supervenes upon, indeed is created by, change. We may expound this view in the following way.

Time, it is said, is a great healer; it is something we spend, gain, and waste; it marches on and it waits for no man. Take the first of these ways of speaking. This is not, for the relationist, an observation about a healing agent, time, but it amounts to saying that various wounds and injuries, setback and sufferings, mend or lessen as the years go by. True, there is metaphor here, but the same style of breakdown is supposedly possible for more literal forms. One event goes on for a longer time than another if there are more swings of the pendulum while the one unfolds as against the other. Once more, no substance or entity, time, needs to be invoked, but the sense is conveyed by an appeal to regularities and periodic processes. Again, we say 'Time passes'. A seeming platitude, but not to be interpreted as a platitude about a quantity or entity, time, which may be set alongside weekends, opportunities, storms, and so forth, as yet another, independent, phenomenon that may be said to pass. Rather, 'Time passes' is to be thought of as reducible to a proposition about what may befall the other members of this list, a matter of events generally taking place in succession.

In focussing on the 'order of succession among events', Leibniz is giving a central place to temporal precedence, to *before* and *after*, but only an incidental place, if any, to temporal periods or intervals, to the notion of *duration*. A melody may be played fast on a musical instrument, it may be played slow; the same ordering of the notes, but that ordering does not determine the differing durations of the piece as played. We have just represented the relationist as invoking periods marked out by the swings of a pendulum, but this procedure relies on the periods being equal in length. Consider some protracted event, an event which goes on for a long time,

and suppose that a long time is understood in terms of a large number of swings of a pendulum. That will not do, according to the absolutist, since the interval between the swings may be vanishingly short. So, whether it is the equality of the intervals or their length, the requirement is for intervals that are objectively equal and objectively long when measured against time.

Leibniz has an answer, but it does not improve upon an appeal to such examples, as when he argues in response to Newton's follower, Samuel Clarke:

> The author objects here, that time cannot be an order of successive things, because the quantity of time may become greater or less, and yet the order of successions continue the same. I answer; this is not so. For if the time is greater, there will be more successive and like states interposed; and if it be less, there will be fewer.
>
> (Alexander 1956: 89–90)

The difficulty with this rejoinder lies with 'like states interposed'. How is the likeness of states, their comparability in terms of duration, to be determined? This is a problem for Leibniz, but it is not as if Newton solves it. For the absolutist, even if all periodic changes in the universe are to some degree irregular, we can supposedly make sense of the identity of temporal intervals in terms of this more basic reality, time itself, which, in Newton's words, 'flows uniformly, without reference to anything external'. As it is, equal divisions in absolute time are not detectable, so it remains a metaphysical hypothesis whether a clock keeps true time. For the relationist, the only comparisons can be between different regularities, as with one clock and another. The very notion of true time may be rejected, perhaps because it is thought metaphysical, or it may be claimed that true time can be secured by making use of nothing more than inter-clock comparisons, or at least by finding some suitable relation between clocks and events in time, but not between clocks and time itself. If no definitive comparison is deemed possible, the relationist may adopt some form of conventionalism, the search for a perfect timekeeper terminating, not in a discovery of a natural or artificial rhythm forever assured of that virtue, but in a decision to adopt one or more of the natural or artificial rhythms available: a chosen regularity wins out because it makes for the most self-consistent measure and the simplest physics, but it is a matter of an agreement to opt for that regularity as determining equality, rather than an incontrovertible proof that it does so.

1.2 ABSOLUTE AND RELATIONAL SPACE

The absolute and relational views of space largely mirror their temporal counterparts. Newton's *Principia* is again the *locus classicus* for the former:

> Absolute space, of its own nature without reference to anything external, always remains homogeneous and immovable. Relative space is any movable measure or dimension of this absolute space; such a measure or dimension is determined by our senses from the situation of the space with respect to bodies and is popularly used for immovable space, as in the case of space under the earth or in the air or in the heavens, where the dimension is determined from the situation of the space with respect to the earth. Absolute and relative space are the same in species and in magnitude, but they do not always remain the same numerically. For example, if the earth moves, the space of our air, which in a relative sense and with respect to the earth always remains the same, will now be one part of the absolute space into which the air passes, now another part of it, and thus will be changing continually in an absolute sense.
>
> (Newton 1999: 408–9)

The space between the driver's seat of a car and the car's dashboard moves about as the car moves, but it moves against the background of a fixed space, being located now in one region, now in another of this unmoving and immovable setting. The car and its contained space move relatively to absolute space. The fixity of absolute space, as illustrated in this contrast, appears to be the leading idea in Newton's conception, but it brings with it a notion of the *identity* of points or regions of absolute space which, as with time, is determined by their immutable order (Alexander 1956: 154). So, our moving car can be said to move back to the same part of space which it occupied before, where this sameness is not defined by physical objects, such as a garage from which the car began its journey, since these, too, might have moved on. Such movement is indeed an inescapable consequence of the perpetual rotation of the earth on its axis and around the sun, but where everything is in flux, absolute space stands fast, providing a fixed setting or background to any and every change of position.

This fixity leads on to the idea that absolute space, having no need of bodies to define its various parts or regions, can exist independently of any objects and, though it cannot exist without God, could well have been or become completely empty. It is, for Newton, a vast receptacle into which the universe was placed, a void replete with its own spatial points. These points being fixed

and immovable, we can allow the possibility of a universe containing a single body in motion, since the object could be moving relatively to such points, points which are truly at rest. If we can posit a plethora of points dispersed throughout space without having to respect any observational constraints, why should we not admit all manner of geometrical figures? And this Newton does indeed allow:

> there are everywhere all kinds of figures, everywhere spheres, cubes, triangles, straight lines, circles, ellipses, parabolas, and all the rest, and of all shapes and sizes, even though they are not delineated to sight. For the material delineation of a figure is not a new production of that figure with respect to space, but only a corporeal representation of it, so that what was formerly insensible in space now appears to the senses to exist.
>
> (Newton 1962: 100, 133)

Could we say that the figures are in space in the same way that they may be in a block of marble? But it is a *marble* sphere that is sculpted from the block, whereas a figure which takes shape in space does not consist just of space. Very well, but suppose we sketch out a sphere in space using lines or paths. Lines and paths have the virtue of not being *of* space, yet not being bodies either. This gives a meaning to what Newton says, though it is perhaps too figurative to capture his thought: the figures are actually, not merely potentially there; it is just that they are insensible. We may grant that points and lines are truly in space, in that they have spatial co-ordinates, but this falls short of ascribing a metaphysical status to them.

According to Newton, the parts of immovable space in which bodies truly move 'make no impression on the senses' (Newton 1999: 414). However, it would be premature to take unobservability to show the non-existence of parts, regions, or points of space, or the meaninglessness of their postulation, since it is as yet not clear what it is that is being alleged to be unobservable, what it would be to observe such parts, as understood by Newton. As we shall see, arguments in this area which conform to the pattern, 'unobservable, hence meaningless', should give way to considerations concerning definition, in a broad sense of the term. So, it is sometimes claimed that, because absolute motion in space is undetectable, it does not exist, whereas what should be said is that, because absolute motion in space is undefined, the question of its existence or occurrence does not arise. We shall have occasion to revisit this issue.

The relationist rejects the conception of space as a possibly empty container, construing it as a system of relations between objects. Thus Leibniz: 'I have said more than once, that I hold space to be something merely relative, as time is; that I hold it to be an order of coexistences, as time is an order of successions. For space denotes, in terms of possibility, an order of things which exist at the same time, considered as existing together' (Alexander 1956: 25–6). So, all movement is with respect to things in space, not to space itself. Take away all bodies, and space itself is no more.

Newton wrote:

> The parts of duration and space are only understood to be the same as they really are because of their mutual order and position; nor do they have any hint of individuality apart from that order and position which consequently cannot be altered.
>
> (Newton 1962: 126)

So, the identity of a part of space or time—what makes it *that* part—is constituted by its order and position; and what is important about order and position is that they are not in turn determined by bodies or events, but are as they are irrespectively of whether the latter exist. But do spaces and intervals of time come in predetermined volumes or lengths enjoying such independence? We can define a region of space as, say, the space bounded by these walls, floor and ceiling; that is, we define *a* space. What is problematic is the conception of this region as a space having an identity which owes nothing to anything *in* space; as though it had a determinate location, though not in a reference-frame defined by any body or bodies. What, we may wonder, would constitute the axes with respect to which the co-ordinates could be defined? If space were empty—a possibility that Newton allows—there would be nothing that provided an origin, or any other reference point.

For Leibniz, the only identity which points of space and time enjoy is what is conferred upon them by the bodies and events in terms of which they are defined or identified. Space is not real in itself, but 'is nothing at all without bodies, but the possibility of placing them', and instants, 'consider'd without the things, are nothing at all; and . . . they consist only in the successive order of things' (Alexander 1956: 26–7; cf. 76–7). To say that space is relative is to deny it an existence independent of that of bodies, but Leibniz's more positive characterization of space needs refining. The grammar does not allow the simple identification of 'space' and 'the possibility of placing bodies', but the translation has to be more roundabout: space (is what) makes possible the placing of bodies; or: there is a space between A and B if and only if it

makes sense to speak of placing a body between *A* and *B* (without displacing anything). We are talking about what is describable, rather than physically possible. Leibniz's positive account of instants is also in need of a more accurate formulation.

Space and time are to be thought of as relations. In Leibniz's scheme this means that they are ideal things, though this is not a categorization which renders them subjective, nor threatens the truth of attributions of duration or spatial, or temporal order (cf. Ishiguro 1972: 106–10). In modern terminology, we might say that for Leibniz space and time are logical constructions out of bodies and events. Equivalently, we could give the following explanation. It was said above that, for the relationist, time is *created* by change. How, it may be wondered, could that possibly be? We may seem to go too far in speaking of creation, but this is simply a matter of making certain *descriptions* possible. Given change we have a foundation for speaking of when something happened, of its continuing to be; given bodies, we have what is needed to allow us to speak of space and spatial extension.

In passing, Leibniz appears to suppose that he has refuted absolute space, or the view that space is a substance, by showing that its existence would conflict with the principles of the identity of indiscernibles—'There is no such thing as two individuals indiscernible from each other'—and sufficient reason—'nothing happens without a reason why it should be so, rather than otherwise' (Alexander 1956: 36, 16). God could be accused of locating the universe where it is, rather than a mile to the left, for no good reason, if there were such a thing as absolute space. Leibniz holds that, since God cannot do anything without sufficient reason, there cannot be absolute space, but his central objection undercuts this charge: there is no threat to God's observance of that principle, since the alternative which absolute space would sanction—location of the universe in one place rather than another—is no real alternative at all, so the question of God's acting arbitrarily or otherwise does not even arise.

We might try to bring together Leibniz's two lines of reasoning by taking him as holding that there is no real difference between the supposedly distinct possibilities, which therefore fail to yield a differentiating reason on which God might act. However, if the identity of indiscernibles is sufficient to settle the matter, the reference to God is unnecessary, yet here and elsewhere in the correspondence with Clarke, Leibniz places less emphasis on that more basic consideration, more on the way God's choices are determined by the principle of sufficient reason.

Leibniz's argument concerning a displacement in time follows the same lines, but presents us with a more complex issue. It may be argued that, if it has been in existence for an infinite time, the universe could not have been in existence for a shorter or longer time up to the present, and even if its history is finite, it could not have been in existence for a shorter or longer time in the sense that more or less time might have lapsed before it began, since the passage of time could not antedate the beginning of the universe. But could we not allow that the universe might have been older without supposing a time before it began, thus keeping time within the universe? True, questions of identity arise. If events are individuated by the date and place of their occurrence, it might seem that a current eclipse, say, could not have occurred at a different time, so not at a later or earlier time since the universe began. However, we can surely say that a longer period of time might have preceded the current eclipse, the eclipse we are now observing. Supposing t_0 the first moment of time, it is not a matter of going back in time beyond t_0, but of increasing the lapse of time between t_0 and the eclipse.

Some relationists feel obliged to say that an empty space is simply nothing, or, with Einstein (1993: x), that 'empty space' has no meaning, but while it may be agreed that the whole of space could not be empty, the spaces that can exist between bodies would not seem to equate literally to nothing. That there should be *an* empty space appears possible. That time should be empty, in the sense that there might never be any events occurring, is highly questionable, but so too is the suggestion that there could be even a period or interval of time devoid of all change. We shall return to these issues.

1.3 METRICAL AND NON-METRICAL CONCEPTS

Absolute time, thought of as a quantity possessed of its own intrinsic subdivisions, intervals against which our clocks are, ideally, to be judged, is difficult to fathom: divisions arise only with events which mark their termini, as with the arrival of the clock hands at a point on the dial. On the other hand, time as duration owes nothing to the existence of clocks, an independence that is shared by many of our temporal concepts, so perhaps something of the absolute conception is to be found in pursuing the respects in which such independence arises. We shall now develop this contrast.

Consider simultaneity and temporal precedence. Simultaneity would normally be explained in terms of events taking place at the same time, where

the significance of this latter phrase lies in what it presupposes by way of a system of timekeeping. So the wedding and the funeral having both got under way at 3.00 p.m., they began at the same time. However, instead of mapping events onto a common time, we may compare them directly, as when we observe two runners leave their starting blocks together, and, without making use of a clock, we can appreciate that two extended events, as a wedding and a funeral, take place concurrently, given that they both begin and end together. Take an event which encompasses another event, as a downpour might encompass rumbles of thunder and flashes of lightning. What we have is, say, rain under way and no lightning followed by rain and lightning co-present, then rain continuing unaccompanied by lightning. Our ability to become apprised of, and to recall, these successive states puts us in a position to say such things as that the downpour preceded and outlasted the lightning, and we can say this without making use of a concept of time which presupposes a means of keeping or measuring time.

Before the introduction of clocks we could speak of one event as going on for just as long as another when their end points coincided, and we could reckon one event as going on for longer than another when the one occurred within the temporal span of the other. But suppose that the rain comes on and stops, and only then does the wind get up, and eventually die down. Could the question meaningfully arise as to which went on for longer? With spatial length there is the possibility of relating objects to a common measuring rod and arriving at an answer in terms of their measured lengths. Alternatively, we may dispense with the measure and compare the two directly: we stand the man up against the door to see which is the taller. With temporal comparisons there is nothing corresponding to the latter when the events lack any temporal overlap, so if there is no temporal measure onto which both events can be mapped, it might appear that the question of their relative lengths would have no application.

That would, however, be an overhasty conclusion. We confidently pronounce some events to be much briefer than others without the benefit of an inclusion of the one within the span of the other. Witness our example of the tune played fast and the same tune played slowly. We are even happy to speak of sameness of length or duration with respect to events separated by a lapse of time, in neither case thinking it necessary to have recourse to a clock. Take a sequence of knocks on a door or chimes of a bell, where the interval between successive sounds is so brief there is little scope for significant error

in judging them equally spaced, each sound being seemingly identical with, and running on almost immediately from, its predecessor. We are not, of course, concerned to answer to the nanosecond exactitude of measurements in particle physics. As the intervals between the sounds become greater we become less assured of their equality unless, for instance, we can interpose sequences of the kind just considered, as when, hearing the tick of a clock, we may go 'tick, two, three, four, tick, two, three, four', and so on. But do we have a criterion for being right in such cases? Even if we forgo complete accuracy, our mere say-so does not give the assurance that two episodes are of equal duration which we may have when their end points coincide. Wittgenstein's observation appears to be pertinent: 'One would like to say: whatever is going to seem right to me is right. And that only means that here we can't talk about "right" ' (1958: §258).

The question of making sense of relative length in the absence of a system of timekeeping will be taken further later. Certainly, the utility of clocks in enabling us to extend our temporal comparisons to non-overlapping events is evident, though the comparisons which can be made without clocks are the more basic. For instance, simultaneity as directly apprehended is not a notion that introduction of a system of chronometry will oblige us to abandon in favour of another, more sophisticated alternative, but it is incorporated into the eventual metrical scheme. The cases of simultaneity which Einstein counts on as being relatively unproblematic are precisely those where we have clock readings and events in the immediate vicinity of the observer and judged coincident by him—much as clear cases of spatial measurement are those in which we can bring measure and object measured into close spatial proximity. After all, timing an event is just a particular case of our basic comparison, its distinctive feature being simply that the events being correlated with the beginning and end of what is to be timed are events generated by a clock or other timekeeper. Accounts of time in relativity theory give clocks a fundamental role, but their very use presupposes a non-metrical conception. Thus, e_1 and e_2 are deemed to occur at the same time if, in suitable circumstances, they can be mapped onto the same clock reading, but if the event of the clock signalling midday occurs simultaneously with event e_1, this is not to be thought of as calling for a second clock giving the same time for these two events. Again, on our account of the basic level at which our temporal concepts operate, we can render 'Events e_1 and e_2 take place at different times' as 'When e_1 takes place, different things are happening from when e_2 takes place'. The different things could

be different clock readings, but there are not *further* things, times, there to be invoked.

Clocks are not needed in order to make sense of simultaneity or temporal precedence, nor for us to know that such relations obtain. Suppose you experience a flash followed by a bang. How do you know that it is the flash that takes place first? I am not concerned with uncertainties which may be prompted by questions about the speeds at which sound and light travel, but the question is, rather: how do you know that the one occurred before the other within your experience? One response is to claim that we just *do* know, that we have to do here with a bedrock form of knowledge that cannot be further explained. Another suggestion might be that we depend on a temporal sense. This cannot be one of the more usual five, since we order events perceived by different senses, as with our flash and bang, but it must be a sense which integrates temporally the deliverances of the others. However, to postulate a sense with no known organ, no known mode of function, looks to be no real advance on saying that we just do know. The right answer, it would appear, requires us to consider the different states of mind associated with the two experiences being ordered: when the flash occurs we have no consciousness of the bang, whereas at the time of the bang's occurrence we have a lingering awareness of the flash. Such a situation is not one where we should most naturally speak of memory, given the recentness of the earlier occurrence, but we note that memory gives us something of the character of the postulated sense, in that it shares with this construct the capacity to embrace the deliverances of any of the acknowledged senses. And, of course, talk of memory becomes more apposite the further removed from one another in time the two events become.

While a community of speakers possessing only non-metrical temporal notions can have the conception of one event as simply having occurred, or as having occurred before another, this is, once more, not necessarily a conception of one event as having occurred at an earlier *time*, or at an earlier time than another event, since this would require them to map events onto a temporal series, and such a development would be yet to come. Indeed, we may even hesitate to speak in terms of a concept of time in their regard, since any term equivalent to our 'time' is clearly dispensable, and they are not in a position to make use of such phrases as 'at a time', 'for a time', 'the right time', 'in time', and so forth. Again, it will not be appropriate to expand 'e_1 occurred before e_2' as 'e_1 occurred at a time before e_2', and while, for us, to say that an event occurred *then* may be to say that it occurred at

that *time*, where this is a matter of time as given by a clock, for the speaker of the more primitive language, the temporal reference will be as determined directly by some past event, rather than by the time onto which this might in turn be mapped, 'at that time' being, even for us, just one among the paraphrases possible for 'then'. Note the analogy between points of time and points of space. '*a* is above *b*' is not to be explained as '*a* is situated at a point above *b*', since there being a point above *b* will be an instance of the former relation.

It is of interest to consider how much of our temporal vocabulary presupposes a chronometry, a system of timekeeping. Not as much as one might suppose, I am inclined to say, for a reason already glimpsed: points and periods are specifiable by singling out certain events, such as the movements of the hands of a clock, but events are still there to furnish points of reference even if systematization into a temporal scheme has not taken place. Consider some of the relevant vocabulary, as 'always', 'never', 'seldom', 'often', 'again', and 'occasionally'. The sentence, 'She has never mentioned the possibility', is naturally paraphrased as 'She has at no time mentioned the possibility', but it could equally be rendered as 'On no occasion has she mentioned the possibility'. Occasions may be specified by means of temporal clauses—'On that occasion—when, that is, she was receiving her degree'—but the identity of the occasion can be determinate without our having to introduce a time or date into its specification. As just illustrated, a clause beginning 'when . . .' can fix a temporal reference without explicit or implicit reference to clock time, and we may observe 'as' in a similar role: 'He fell as he was approaching the house'. In 'At this point the chairman interrupted', 'at this point', like 'at this juncture', would not naturally pick out a time, but we could again enlarge upon its reference with a temporal clause, 'when the speaker started to ramble'. 'Always' is often 'at all times', but the reference would be more restricted with 'He is always complaining', and here a phrase beginning 'whenever . . .', with appropriate occasions specified, may be usable in its stead. Think, too, how qualifications such as 'incessantly' and 'invariably' may be enlisted.

There are many uses of 'time' itself which can often be understood without the benefit of a chronometry, as with 'for the last time', 'several times', 'sometimes', and 'time and time again'. If we were to say 'The children were all talking at the same time', we should be unlikely to be thinking of a time as given by a clock; it is a matter of the children all talking together, or at once. With respect to some uses there may be uncertainty whether a system of

timekeeping is presumed, but by and large the distinction between metrical and non-metrical uses—and the primacy of the former—are straightforward enough. By and large, but where in our scheme do days, weeks, months, and years belong? On the one hand, they give a measure of time, on the other hand, unlike seconds, minutes, and hours, they are not tied to the use of clocks. However, the natural regularities on which they are based give enough of an analogy to clocks to place them in the metrical category.

We may note that one phenomenon central to debates about time takes on a different complexion so long as we stay with the non-metrical concepts, the phenomenon, namely, of the passage of time. The idea that time passes or flows is often thought to be at the heart of our ordinary conception of time and indeed to render that conception unsustainable. There is, as noted, reason to say that a community without clocks would not have our conception of time, and some temptation to withhold any talk of time in describing their linguistic practice, but I would think that this last position is resistible, our 'time' not being tied exclusively to a chronometry. At all events, we are happy to talk of the passing of the years, or to say that the day passed uneventfully, and if the notion of time's passing is held to be problematic when 'time' is not thought of as doing duty for specifications of days or years, or indeed of minutes or hours, this would seem to be because it is dimly thought of as naming some elusive and problematic quantity. Certainly, it is hard to see how the passage of time could be thought problematic without the assistance of some such misconception. This is another question which we shall take up again.

The primacy of the non-metrical conception has consequences for paraphrases of sentences which do not themselves refer to times, as when it is suggested that 'all I need to know in order to understand and use the sentence "*e* is past" is that it is true at any time *t* if and only if *t* is later than *e*' (Mellor 1998: 3). Eminently reasonable though this may seem, it presumes a grasp of a system of dating which may be lacking in someone who none the less has an adequate understanding of the words.

Likewise with attempts at paraphrasing tensed sentences by means of tenseless sentences incorporating dates, as when 'Henry Jones of Lee St., Tulsa, is ill' is rendered as 'Henry Jones of Lee St., Tulsa, is ill on July 28, 1940', now with tenseless 'is' (Quine 1980: 6). If all indications of tense are stripped out, we may object to this translation on the grounds that it results in a form which conveys both more and less than the original. It involves a loss of information, in that it gives no indication that the state of affairs reported

is ostensibly contemporaneous with, before, or subsequent to the report. On the other hand, since the proposed translation relies upon the availability of a timescale, it exceeds the resources of our pre-metrical language, so now errs in the opposite direction, introducing concepts which go beyond what is required for an understanding of the original proposition.

Elaborations of tensed sentences which involve explicit references to times are common in formal treatments of tense. Thus, it is claimed that one who asserts 'Mary will love Bill', 'intends to say that *at some time after the time of his utterance* Mary will love Bill', which is then formalized as 'For any speaker s, time t, "Mary will love Bill" is $\text{true}_{[s,t]}$ iff [there is a $t_1 : t_1 > t$](Mary loves (t_1)Bill)' (Lepore and Ludwig 2003: 55, 57). Such renderings may be useful for some purposes, but they cannot be said to make clearer what a speaker who has mastered such a sentence as 'Mary will love Bill' perforce understands thereby. Again, where 't^*' approximates to 'now', we may have similar reservations about the translation of 'Brutus hailed Caesar before he killed him' as '[There is a time $t_1 : t_1 < t^*$][there is a time $t_2 : t_2 < t^*$ & t_1 is before t_2] (Brutus hails (t_1) Caesar and Brutus kills(t_2) Caesar)' (ibid., 69), the more minimalist reading which simply represents the hailing as before the killing being truer to our understanding of the form. However, the various tensed forms which it was hoped to explain with such translations are readily enough accommodated in a vocabulary which is tailored to the more primitive situation. As we shall also see, even the fundamental term 'now' can be explained without our having to take it as referring to a time.

Before concluding this section, it is worth reflecting on what is involved in seeking to elucidate the meaning of a word such as 'time'. Friedrich Waismann insisted that there is no other word, nor combination of words, that does the job that 'time' does, backing up this claim by considering some of the range of idioms which defeat any attempt at providing a single formula for their elucidation. Among expressions for which rewordings are possible, but in which 'time' does not allow of a single translation, he cites 'in time', 'time after time', 'had a good time', and 'mark time'. To say, for instance, that time is 'the form of becoming', 'the possibility of change', or even 'measurable duration' is not to offer a possible substitute for 'time' in 'Don't hurry, still plenty of time' (1968: 140). But, he insists, the failure of such substitutions does not mean that our understanding of time is imperfect: 'if anyone is able to use the word correctly, in all sorts of contexts and on the right sort of occasions, he knows "what time is", and no formula in the world can make him wiser' (ibid., 141). Compare the word 'mind', which figures in such

disparate idioms as 'make up one's mind', 'be in two minds', 'change one's mind', 'have a sharp mind', 'have one's mind on one's work', and so forth. We may have some sympathy with the definition of 'mind' as 'the capacity to acquire intellectual abilities' (Kenny 1989: 20), but there is no question of replacing 'mind' by this phrase in any, let alone all, of the above idioms, yet one who has mastered the use of the word in such contexts has thereby acquired an adequate grasp of the concept.

However, may there not be central uses of 'mind', and uses of particular philosophical interest, for which Kenny's characterization is adequate? 'Having a mind', say, may equate to 'having the capacity to acquire intellectual abilities', a characterization of possible value when we seek to define a crucial divide between human beings and other animals. It is, after all, one thing to have mastered a family of uses, another matter altogether to be articulate about what certain of those uses involve. Likewise with 'time', where its application to points and periods of time is of philosophical concern virtually to the exclusion of many idiomatic uses, and where an accurate paraphrase could well be of service, a paraphrase that is likely to be at the level of the sentence rather than at that of the word.

We introduced the division between metrical and non-metrical concepts with a view to determining whether the abundance of temporal concepts which owe nothing to clocks may point to the possibility of an absolutist analysis. If the absolute/relational matched the non-metrical/metrical distinction, this would go some way to explaining why the absolutist and the relationist have each found their own views compelling: concentrate on non-metrical concepts, and, it may be thought, absolutism comes into focus, concentrate on the metrical, and relationism is favoured. However, while the division is of importance in revealing the narrowness of accounts of temporal concepts which are exclusively concerned with time as given by a timekeeper, forgoing a reliance on events definable in terms of clock readings does not mean that absolutism is supported, since a dependence on the broader class of events remains.

2

Time, Order, and Direction

There is more than one way in which time and space have been considered absolute (see Earman 1989: 11; Mackie 1983), but the feature here regarded as central is that of independence; independence of events in the case of time, independence of bodies in the case of space. Relationism, by contrast, affirms their dependence: periods and points of time require events or changes to mark their termini or location; spatial distances and points require bodies or other spatial occupants for their existence. In Leibniz's conception of time pride of place goes to 'order of succession among events', and hence to the notion of temporal precedence. We have sketched an account of how we may *know* that *x* occurred before *y*, but can we explain what it *is* for *x* to occur before *y*, a notion which also emerged as central in our discussion? If a knife was sharp and the same knife was blunt, we have to be speaking of the knife as it was at different times, but nothing obliges us, with this acknowledgement, to say that the knife was blunt *before* it was sharp, or conversely.

Events are ordered, but so too are moments of time, and for the absolutist the latter are basic. Even without events, time flows in the earlier-later direction, which seems to mean that a moment or instant of time has the place it has in the ordering as of its nature, a conception we shall find reason to query. The relationist puts events first, regarding a given instant as having its place thanks to the ordering of events in terms of which it is defined. Prima facie, this position is the more plausible, but it must be shown just how temporal ordering can be secured by an appeal to no more than events or changes.

2.1 TEMPORAL PRECEDENCE

One of the many issues in which the need for an account is pressing concerns the character of the so-called 'B series'. Following the usage introduced by the Cambridge philosopher, J. M. E. McTaggart, the ordering of times or

events as past, present, and future is commonly known as the 'A series', whereas the B series does away with this ordering, making do with just simultaneity and the relation 'e_1 is earlier than e_2' or its converse, 'e_2 is later than e_1'. This distinction makes for a different alignment of concepts from that of the metrical/non-metrical, both of which deploy the concepts and relations of either series. Questions commonly pursued in connection with McTaggart's series relate to the possible priority of the one over the other, the way each is involved in our understanding of change, and the very coherence of our temporal notions—and therewith the question of the reality of time. Someone who considers the B series fundamental will have to reconcile himself to its absence from the non-metrical scheme if points of time are taken to be the relata of the *earlier than* relation, and while events will still be there to fill that role, these can hardly be accepted without accepting the reality of change. And, of course, points themselves have significance only as termini of temporal intervals, periods during which time passes.

The formal properties of temporal precedence are evident enough: 'e_1 is earlier than e_2' is an irreflexive, asymmetric, transitive relation. On the other hand, so too is 'e_1 is later than e_2'; how are the two to be distinguished? If asked what distinguishes earlier from later events, we might well reply that, as far as the character of an event is concerned, nothing at all. A movement of the leaves in the breeze could be described in as much detail as you wish without our being able to tell whether it was earlier or later than the closing of a gate; just as with nearby and remote objects, there may be *only* the difference in 'distance'.

We may of course say that we are aware of an order of precedence, of the departure of the milkman before the arrival of the postman, rather than the other way around, and we may explain this along lines indicated above. The direction of time is the direction of increasing knowledge. However, even if we set aside difficulties stemming from the speeds at which sound and light travel, there are objections to saying that the temporal order of e_1 and e_2 is simply the order in which they fall within our experience. First, many events fall outside everyone's experience, including everything that happened before the advent of sentient life. Second, we may well want our knowledge to track the order of events, to apprise us of that order rather than be called upon to dictate it; even, sometimes, to allow that an objective order may be invoked to correct our seeming knowledge. These points come together in a natural response to the suggestion that an unwitnessed event x was earlier than an unwitnessed event y if an observer *would have* become

aware of *x* first. Surely, the only ground we could have for supposing this to be so would require knowledge that *x* occurred first. Third, if we invoke the order in which we come to know of each, that does no more than present us with another, isomorphic, temporally ordered succession—that of our states of knowledge: to say that *x* is identified as the earlier event through being the event that is known of first, we repeat the crucial notion of being *first*.

True, to the question, what is it to know of e_1 first, we have an answer: it is for knowledge of e_1 to be possible when knowledge of e_2 is not, whereas knowledge of e_2 may be accompanied by a memory of e_1. This last suggestion just brings us back to the first two objections, but it is none the less worth dwelling on a little longer. As indicated, it is not always in place to speak of memory if we are concerned with happenings which are separated by only a brief time. Suppose you are aware of a spoken word, say 'chimpanzee'. Your grounds for saying that what you heard were the syllables in this order—'chimp' followed by 'an' followed by 'zee', and not 'an' followed by 'zee' and 'chimp', say—are unlikely to bring in memory in the relevant way. Although you will doubtless have registered the temporal order, it is not that you were still aware, though to a lesser extent, of 'chimp' when you took in 'zee', in the way that talk of memory requires. You may be incapable of the more finely focused awareness—or, indeed, lack the ability to put something out of your mind—that this would demand. Of course, memory will come into play if it is a matter of a word heard at some time in the past, but even here we are more than likely to remember the word as a unit, rather than remember remembering 'chimp' when we heard 'zee'. Our awareness of such an item is not normally segmented into a series of discrete phases which we might recall in the wrong order. We could subdivide the sound heard into 'chim', 'panz', 'ee' as well as into 'chimp', 'an', 'zee', and we know it was 'chimpanzee' that we heard and not 'panchimzee' because there is a subdivision of the latter—'panch'—which simply did not figure in what we heard.

There are temporal items which we take in as wholes, items having a *Gestalt* which can be recognized without drawing upon a past/present contrast defined in terms of memory—much as a group of three objects can be seen to be three in number without our having to count them. The temporal ordering, as this might be involved in movement, say, is a readily identifiable feature, a feature which can be 'read off' an unfolding event. It is not because we *remember* that there were earlier phases that we know that we are presented with something that is in the course of changing, progressing,

developing. So, when we are aware of a sound that is increasing in volume or in pitch, we may be continually aware of this temporal direction. Indeed, it is not as if we had somehow to integrate a series of progressively louder or higher intervals, though intervals which did not differ within themselves. Such an interval may have no reality for us. If there are any such unchanging phases, they cannot be measured by an instant.

However, while memory may not be the concept to invoke in such cases, this is not to say that no concept in this general area is in place. When you hear the word 'chimpanzee', you know that 'chimp' has been uttered when you hear 'an', and you know that 'chimpan' has been uttered when you hear 'zee'. It may not be in place to say here that you remember, suggesting as it does that the initial phase of the utterance has by now receded sufficiently far into the past to require an act of recall to bring it to mind. *Knowledge* of the earlier syllable is, by contrast, quite undemanding in this respect, being something that can be shown in what you do and say—as, most obviously, when you repeat what you have just heard.

Consider again our flash and bang. The lapse of time between the two may be sufficient to have us speak of remembering the flash when the bang occurred, but it may be that the flash merges into the bang to give us something more akin to a temporally structured event. We take it in as a whole, along with its ordering, being able to say what occurred first within our experience without relying on memory. Note that with neither knowledge nor memory need the concept of clock time be invoked, both being equally primitive in this respect: it is not because we know of the times onto which the syllables of a spoken word are mapped that we know the order in which they occurred, and even when a clock is called upon to perform such a service, a more basic ability to order temporally is presupposed. Thus, it is clear that the use, the interpretation, of the timescale is dependent on our having the concepts of *before* and *after* which the primitive scheme yields, since this relation of precedence has to be enlisted in mapping the scale onto events the right way around, pairing off earlier dates with lesser numbers. How otherwise might the earlier and later dates be identified? You cannot look to the phenomena themselves for an answer, abstracting from their known relations of precedence, since whatever the difficulties in supposing events to unfold in reverse order, our grounds for saying that e_1 preceded e_2 are not, in general, that the reverse ordering is physically impossible. Anything offered as a reversal of time can be no more than a reversal of events within time. Instants of time do not possess an individuality which would allow us

to say that, while t_i in fact preceded t_j, we could have recognized t_i as t_i had it followed t_j, as if instants had an identity which could survive translation to another location in the temporal series. This is misconceived. Indeed, even to say that one instant is *like* another is surely nonsense—as if instants were, like specks of dust, items which we might compare.

The issue is generally thought of as the problem posed by the 'direction of time'—a confusing phrase, suggesting as it does that the passage of time is itself like a process which may occur *in* time, a process which we can conceive of as having occurred in reverse. True, there are some who subscribe to the conceivability of a reversal, in that they think it relevant to point to the lack of empirical evidence in favour of its actuality. Thus, Paul Davies writes: 'It is also important to note that we have no physical evidence that time *itself* is asymmetric' (1981: 64). But how could we have such evidence? It makes no sense to suppose that time might have gone from later to earlier. Compare the view, often expressed, that constructing a machine which would take us back in time presents a formidable technological challenge, another view which mistakes a conceptual for an empirical issue. With respect to events, there may be more than one possibility: e_i may occur before e_j, but it may occur after. How does it stand with times? Here, it may be said, matters are otherwise: if t_i occurs before t_j, it is logically impossible that t_i should have occurred after t_j. That is one way of putting it, but I should prefer to say that, whatever regular succession of events we select as our timekeeper, we shall associate earlier times with earlier members, later times with later members; and we should have done the same had the succession occurred in reverse. It is in this way that the directional necessity is assured, though the ordering of times is dependent on an ordering of events that is itself only contingent. Reversing that association would simply be interchanging the meanings of 'earlier' and 'later': a succession of events could perhaps take place in reverse order, but the meaningfulness of 'The earlier event might have been the later event'—a reversal of events in time—does not ensure the meaningfulness of 'Earlier might have been later'—a reversal of time itself. Or, if the latter means anything, it will amount to no more than the former. It is a matter of experience which of two events occurs first, but it is not a matter of experience what counts as occurring first. Compare: it is only contingently true that the objects on my left are there rather than on my right, but that does not mean that left might have been right. Note, too, the following corollary. The explanation why event e_i occurs before e_j could be causal, in so far as the occurrence of e_j requires the prior occurrence of its cause, e_i. However,

if the rationale for time's direction is as just proposed, the explanation why the *time* of e_i's occurrence, as given by a timekeeper, is before that of e_j is as far as it could be from being causal. Noon's occurrence subsequent to 11.00 a.m. is not the result of a causal contingency. However, the question remains as to how the notion of temporal precedence among events can be explained.

The internal structure of a temporal item appears to be very much an intrinsic feature of that item, something of which we may become apprised rather than being somehow dictated by the particular form that our knowledge takes. Does this intrinsic character extend to the matter of which element occurs first and which last?

If you play me a recording of a sequence of sounds, *do re mi*, and also a recording of the sounds reversed, *mi re do*, I shall be unable to tell which gives the actual ordering of the original sequence. Aspects of the internal structure of the sequence may be invariant—*re* is between *mi* and *do* in either ordering—but it would appear that a relation to something external to the ordering is required to identify which note was first, which last. And now it appears that any scale onto which the notes were mapped could serve to inform us of the temporal order only if it were itself of the same problematic kind—having earlier and later points. That, of course, is why saying that *re* occurred at an earlier *time* than *mi* is ultimately of no help.

There is some analogy between '*x* is before *y*' and such spatial relations as '*x* is to the left of *y*', and in either case, it may be said, we have reached bedrock. There is no way in which we could explain which side is left and which is right to someone in another world. Likewise, it would appear, with earlier and later. Is it possible that the search for an objective grounding of temporal order is doomed to failure, the earlier/later relations being purely perspectival? Could it be, that is, that a given series of events could equally be conceived of as advancing from those we currently deem present to those we currently deem past? The natural analogy here is with spatial ordering. I am looking at a house with a garage to its left, but if I go behind the house the garage will be on my right; if I go to one side, the garage will be in front and the house behind, and in the view from the other side these positions will be reversed. The claim that the spatial ordering is perspectival can and should respect what is intrinsic to the ordering: engine, carriage, guard's van is also guard's van, carriage, engine, but not guard's van, engine, carriage. However, while the relations within an object remain invariant, orientation along a left-right axis is not among the intrinsic relations.

We may be disposed to reject any intrinsic temporal asymmetry on the grounds that we can seemingly imagine foreknowledge—something like *déjà vu* on a large scale: suppose memories to be obliterated and supplanted by such knowledge, and we are seemingly left with an appropriately reversed perspective on our world. We shall argue later against the possibility of precognition, but at this point it would be premature to write off all attempts at providing a more positive account of temporal precedence. We might introduce a simple formulation in the following way. A possible confusion in speaking of 'the direction of time' was mentioned, and a further clarification is needed. The temporal series does not allow of reversal, but someone could ask: which direction do you mean, forwards or backwards? 'Direction' need not be associated just with the latter. Forwards, of course, it will be answered, and that surely is readily enough elaborated: it is a matter of the direction towards a future time when starting from any point—past, present, or future—chosen as present.

This simple elaboration provides a basis for defining precedence, and there has been no shortage of proposed accounts along these lines. Robin Le Poidevin cites the following four analyses of 'x is before y' as having a reasonable claim to exhaust the alternatives (1999: 28–9):

(1) whenever y is present, x is past.
(2) it either is, was, or will be the case that both x is past and y is present.
(3) x is more past, or less future than y.
(4) x is n units past and y is m units past, and $n > m$, or x is v units future and y is w units future, and $v < w$.

Is any of these satisfactory, or the basis for a satisfactory analysis? It would appear that they are all correct, but are they compromised by their reliance upon the notions of past, present, and future? Certainly, those who wish to have no dealings with the A series will not approve of this involvement.

This question raises a point of more general interest: how is it possible to give a paraphrase of a form of words that is both correct and non-trivial? If Q gives an accurate analysis of P, surely it can do no more than say the same thing in other words, so hardly represents a substantive advance; failing that, it will perforce be incorrect—Moore's paradox of analysis. But the first condition makes for a necessary constraint on a correct analysis, and saying the same thing in other words need not result in triviality. It is the character of the 'other words' that matters. Finding a synonym may be of no help, but there can be enlightenment in seeing how a combination of

other concepts can yield an equivalent phrase. The apposite objection is that circularity is involved if the concept to be defined recurs in the explanation. This would be so if, for instance, we laid it down that x precedes y if more has happened since x than since y, 'since' being too close in meaning to 'after' to offer enlightenment. Again, if we have an ordered sequence of events, $\ldots e_i, e_{i+1}, e_{i+2}, \ldots$, and wish to define the later of two events as the one with the greater number of antecedents, we have to know whether the sequence, as represented, goes from later to earlier or from earlier to later. Formulations (1) to (4) do not appear to be circular, but while they are not trivial, there is still a question as to how much light they throw on the *earlier than* relation. Moreover, while we may have no compunction in appealing to the A series, it would be desirable to eliminate this contentious element, if possible. So, let us see if we can do better.

2.2 CAUSATION AND ORDER

Questions about the direction of time are often formulated in terms of time's possible anisotropy, as we have already glimpsed. A series is isotropic if it is the same in either direction, if no particular direction is distinguished or privileged. It is anisotropic if it is not unvarying. It is not clear what this means. If it is said that time is the same in both directions, that is, whether we go back into the past or forwards into the future, then we at least have two directions, so we should perhaps think of isotropy as a matter not so much as not varying *in* direction as not varying *with* direction. However, given the way the temporal ordering is totally dependent on the ordering of events, and in such a way that a reversal of time order is ruled out, the question to ask is whether the series of *events* is isotropic. Though still unclear, this will be a matter of there being no difference that flows from a difference in temporal order.

Suppose that e_1 precedes e_2. What is there that holds just of e_1 by dint of its being earlier than e_2? To repeat, beyond the matter of precedence, the answer may be, it would seem: absolutely nothing. We are considering, let us say, a high-pitched and a low-pitched sound occurring at t_i and t_j respectively. There is nothing about either that makes this ordering inevitable, but the sound that occurred at t_i might just as well have occurred at t_j, and conversely, without detriment to the character of either sound. But, surely, occurrence at a different time would have made for a different identity for each? Yes,

but that does not serve to explain that difference, since it is on the time of occurrence that their identity is based. Clearly, there is a dearth of relations to which appeal might be made in defining temporal precedence. However, we have yet to consider the favoured concept, that of causation, a concept which may be thought to offer the prospect of breaking away from such notions as '*A* has happened when *B* happens', '*A* is past with respect to *B*', and other formulae which are too close to '*A* is earlier than *B*' to provide illuminating analyses of this relation.

It was suggested that 'e_1 preceded e_2' compares with '*x* is to the left of *y*' in that any explanation we might give of these formulae to someone in another world would fail to distinguish them from 'e_1 followed e_2' and '*x* is to the right of *y*' respectively. However, we are not so helpless with the temporal relation. If it can be said that *A* caused *B*, the converse temporal ordering is ruled out. True, if the only reason why we cannot speak of *A* as the cause of *B* is because *A* does not precede *B*, if the relation between the succession *A* then *B* is otherwise identical with the succession *B* then *A*, then we cannot appeal to causation to pin down temporal precedence, since in another world it could be that the opposite usage had been adopted, only an event *A* which followed *B* being allowable as its 'cause'. However, while this may make for a difficulty with characterizations of causation which rely on no more than an appeal to necessary and sufficient conditions, when we look more closely at causation we shall have reason to reject any such symmetry. None the less, to exploit the temporal direction of the causal relation in actually analysing temporal precedence is another matter, and here the prospects are not encouraging.

In considering temporal precedence and causation, it would appear that the basic relation, the relation which holds without exception, is negative: if *A* is earlier than *B*, then *B* cannot be the cause of *A*. We also have the more positive condition that *A could be* the cause of *B*, but this appears to mean only that at least we do not then have the disqualifying order given with *B* before *A*. That is all that could be said for, say, the suggestion that sprinkling salt on an egg at breakfast could cause a solar eclipse at noon. As temporally asymmetric, any causal series will deliver us points in the order required to define a temporally directed scale. However, while the major significance of precedence may reside in what it makes possible causally, it is not by establishing *A*'s causal potential *vis-à-vis B* that we learn that *A* preceded *B*—or at least that *A* did not succeed *B*. On the contrary, it is the temporal ordering that determines the possibilities, rather than that

we know first what caused what and infer the temporal ordering from this datum. My realization that today is a bank holiday occurred just before a large pigeon came into view. It would be quite ludicrous to suggest that my knowledge that the events occurred in this order is based on a belief that the former could have caused the latter. Not only does this 'could' furnish no more than the minimal condition indicated, but the 'possibility' which it presents is clearly dependent on the temporal ordering's being as it is.

Note that the difficulty cannot be circumvented by shifting to the formulation: *x* is earlier than *y* if and only if some event simultaneous with *x* is a cause of some event simultaneous with *y*. First, this becomes circular if two events are defined as being simultaneous if neither precedes the other—an obvious condition to invoke. More important, whilst knowing that *x* preceded *y*, we may have no idea what the correlated causes and effects might be. So, I see a leaf flutter to the ground and, a few minutes later, a friend coughs. Must I suspend judgement concerning this order until I have identified two further events, one past and one present, which are causally related? I may be hard pressed to specify *any* event simultaneous with the leaf's fall and leading to an event simultaneous with the coughing, and while I know that there are bound to be such, these would again be events which we could know to be causally related in the right way only if we knew which occurred first.

The point can be generalized to other processes in time. The temporal ordering of events is not something that has to be learned by attending to the character of some natural process, yet the question whether temporal order is objective tends to become the question whether there are any physical processes with a unique direction. How, one might wonder, might we know *which* direction? Compare Eddington: 'There is no other independent signpost for time in the physical world—at least no other local signpost; so that if we discredit or explain away this property of entropy the distinction of past and future vanishes altogether' (1935: 465). Suppose this uniquely irreversible process is given by entropy, which always increases over time. By what do we establish that the increase is from earlier to later? Not by reference to entropy itself. Again, it would be quite unreal to base our appreciation of the temporal ordering of events within the universe on the temporal direction in which the universe expands.

Why, we may wonder, is explanation from earlier to later facts never the other way around? Is this simply a corollary of the fact that causation is bound

up with explanation? There is a tendency to regard the qualification 'causal' in 'causal explanation' as redundant, but not only is not all explanation causal explanation, the very question is in a sense secondary. Thus, among the things you can explain are the meanings of words, local customs, systems of government, techniques, proofs, and the workings of the General Synod. To look for unity among *explananda*, we might fasten on the clausal renderings which are generally possible, explicitly or implicitly. That is, explanations are commonly explanations *why, what*, or *how*. Clearly, explaining what 'amortise' means is not a causal matter, nor is explaining how to determine square roots or why Easter falls when it does. 'Explaining why . . .' is more promising, obviously, but if this is a causal matter it is not thanks to 'explain' but because 'Why . . . . ?' is—when it is—a causal query. What is raised with the question dictates what holds for the larger context with 'explain'. To explain is to elucidate, to make clear, and that does not always mean specifying a cause. What correlates more closely with explaining is giving a reason.

The appeal to causation, or indeed to other physical phenomena, does not appear to offer a basis for defining temporal order, but this does not mean that we are obliged to fall back on accounts which risk circularity through their use of such notions as those of past and future. We noted that while events could conceivably occur temporally reversed, the same cannot be said of moments of time, since we shall always associate earlier moments with earlier events, later with later. Given this dependence of time on change, we should expect the direction of the former to be derivative from that of the latter, which suggests that we might look to change in defining the relation of temporal precedence. While particular changes may be reversible, at least theoretically, the notion of change itself is a notion of something that goes from one state to another, a relation which holds in one direction only. Physical theory may explain the direction of a change—why a given development runs from *A* to *B* rather than from *B* to *A*—but it does not require any theory, physical or otherwise, to explain why change is from earlier to later. We accordingly have the formula: *A* is earlier than *B* if and only if there is a change from *A* to *B*. With this account, much falls into place. It was pointed out that when we are aware of a sound that is increasing in volume or in pitch, we may be continually aware of the temporal direction involved. What we are then aware of is a change from one state to another, but we need not be aware of any relation of causation.

2.3 ORDER AND CHANGE

One attraction of the appeal to causation is that it avoids the triviality threatened with the invocation of purely temporal terms. However, there would appear to be no advantages which causation has in this role that are not shared by the more broadly applicable notion of change, which provides a basis for a temporal ordering whether its terms be past, present, or future. Not only is causation a particular instance of a temporally ordered process, but we are required to ascertain the temporal relations between *A* and *B* before allowing that *A* may be cause of *B*, and even when *A* and *B* are part of the same process, a process which involves a change from *A* to *B*, that is no guarantee that *A* is a cause of *B*. A red object may become pink, a hot object become cool, but while it is a matter of one state leading on to another, in neither case is the first state describable as a cause of the second. We may also note that the appeal to change does not have to contend with an analogue to the possibility of backwards causation. True, this is not, as we shall see, a possibility which survives scrutiny, but it appears immediately incoherent to claim that a change could go from later to earlier, whereas some have thought that the incoherence of backwards causation at least needs arguing, or indeed that such causation may actually be sanctioned.

But can we say more than that change is necessary if there are to be instances of 'e_1 precedes e_2'? Take an event having two termini, as with a balloon that is empty of air and then inflated. To single out one terminus as the beginning of the change, as what occurred first, is simply to *apply* our concept of *earlier than*, not to elucidate it. However, this objection does not appear to carry any weight if we formulate the characterization in terms of a change *from A* to *B*. *A* need not be chosen for its standing as temporally prior to *B*, which may not as yet exist; indeed, *A* does not have to be thought of in temporal terms, but just as a point from which change proceeds, as with fading from bright to dim or falling from the table to the floor, the table providing a spatial point of origin from which the movement proceeds. Without identifying *A* as a temporal beginning, and without any intrusion of a past tense, we can say that if *x* moves from *A* to *B*, then there is a change in *x*'s position which implies that *x*'s being at *A* is earlier than its being at *B*. Note that 'from' and 'to' do not of themselves carry an implication of an earlier to later ordering, an implication which might trivialize the point we are resting on 'a change from *A* to *B*'. 'From' signifies a point of departure,

'to' a point of arrival, but the direction can be back in time, as we consider our appointments from dinner time back to lunch, and there may be no temporal order at all, as with 'from top to bottom'.

Seeing *x* move from *A* to *B* is an adequate basis for a claim that it was by observation that one learned that *x*'s presence at *A* preceded its arrival at *B*. It also makes clear that a special sense is not necessary for the acquisition of such knowledge. It is not that we identify the direction of time and direction of change independently, then find them to be the same. If we can be said to perceive that *A* is earlier than *B* in witnessing a change from *A* to *B*, we have a direct apprehension of the relation rather than an inference, and if we have mutual entailment—'*A* precedes *B* if and only if there is a change from *A* to *B*'—then perhaps we can be said to have a satisfactory analysis. In short, it is difficult to see what reason there could be for insisting on the less readily satisfiable causal relation in preference to the less demanding notion of change. Not only does an account in terms of the latter fit the basic, non-metrical case, but it does so without making use of the temporal concept which we seek to elucidate. Furthermore, it is an account that qualifies as objective rather than as egocentric or subjective. The temporal ordering of the phases of an event is an *intrinsic* feature of the event. Note that while we do not make use of the A series notions of past, present, and future, given that the relation '*x* is earlier than *y*' is at the heart of the B series, and given that this is to be analysed in terms of a change from *x* to *y*, we can say that change is at the heart of the B series.

Just as the causal account has to be made to fit events which, while not simultaneous, are not related as cause and effect, so our account has to accommodate events which are not phases of a single change, as when a bang is followed by an unrelated flash. What can be said to change in such a case? When there is no subject of change, what does change amount to here beyond: there was a bang and then a flash? We have to look to a wider setting; at the widest, a world with a bang becomes a world with a flash. Clearly, we have to be able to individuate flash and bang in some way, since our world with a bang could also be a world with a flash, though not the flash we were speaking of, and this difficulty becomes more acute if we envisage identical events, as with one bang followed by another, indistinguishable, bang. We must, it would seem, look to a difference elsewhere, as when a bang and a puff of smoke are followed by a bang without smoke, and if there is nothing in space then we may have to couple succeeding bangs with different thoughts or states of mind, say. This could cover the case where the transition is from a

bang to a bang accompanied by a lingering awareness of a bang, or experience of a bang when a bang is still ringing in our ears. This does not make an appeal to memory inescapable; that is just one of the possible cases—and not necessarily to the point if the interval between bangs is very short.

It is not uncommon to find an appeal to memory and consciousness in explicating, and indeed grounding, our temporal notions. The place of memory is worth a further word. Let us suppose that a certain thought is engaging your attention. How do you know that it has any temporal antecedents in the form of others of your thoughts? By memory, surely. But suppose that the only data to which you have access are your thoughts. What sense can you then attach to the idea that there really was the thought of which you have a seeming memory? Might it not be that there is just your present thought accompanied by a dimmer one? This is a question we might have raised when introducing our pre-metrical conception of time. It was then suggested that we could know that a flash preceded a bang because when the flash occurs we have no consciousness of the bang, whereas at the time of the bang's occurrence we have a lingering awareness of the flash. As with a memory, so to speak of an awareness of a flash, however faint, makes a claim to knowledge, not just to a state of mind. To speak of a memory, even just with reference to our own thoughts, is to imply that what we take ourselves to remember was indeed so. How can we understand 'getting it right' in such a case? If we are not entitled to speak of genuine memory, then we have no warrant for speaking of past thoughts, and since we are supposing that thoughts and only thoughts are the data to which we have access, we shall have as yet no warrant for speaking of a past. We have here an argument against a purely subjective view of time, a view which relies entirely on thought to construct a temporal ordering.

Change from *A* to *B* can be joined by other concepts which imply an earlier/later ordering, as when we speak of becoming ever frailer, of going from rags to riches, or of love giving way to indifference. In all such cases, however, we may still wonder whether we have anything of use in characterizing temporal precedence. Suppose that our concept of change was 'isotropic', that 'change from *B* to *A*' applied in the same conditions as 'change from *A* to *B*'. What differentia would have to be introduced to restrict the phrase to the latter? Just the condition of temporal priority which we are trying to pin down, it would seem. So, let this more general notion be expressed as '*A* and *B* are temporally separated changes'. Then 'There is a change from *A* to *B*' becomes '*A* and *B* are temporally separated changes and *A* is earlier than

B'. However, we do not have to enlist this formula, since it is precisely the idea of a change or transition *from* the one state *to* the other that it fails to capture. Here it is perhaps worth drawing on remarks made above about the way in which a temporal ordering can be 'read off' an unfolding event. When viewing something in the process of changing, it is not as if our awareness was confined to an unchanging phase, a static scene which a snapshot might deliver, but we are able to take in differing steps in the change, with the time spanned too short for memory to come into play. We are aware of the diver plunging into the water, the bird flying from tree to tree, the sound increasing in loudness. The diver's movement is a movement from one place—the side of the pool—to another place—the water—the reverse ordering being a movement from the latter to the former.

We broadened the notion of a change from *A* to *B* to cover the case where nothing more than a common setting links the two episodes: a universe with *A* becomes a universe with *B*, as when a loud sound succeeds an unrelated soft sound. However, the important species of change is not of this minimal kind whereby one episode simply gives way to another, but the more full-blooded change given with a temporally extended development, as when a loud sound becomes soft, something more than a common setting bridging the gap between the termini. This species is important in that without it there would *be* no direction to time. That is, if we imagine a universe which is totally static, except for two unconnected, non-simultaneous events—a blue flash of light, say, and a yellow flash—can we be assured that one of them precedes the other? If there could be time without change, there would be an answer to the question of which is first, but how can times be anything other than fictions in such a universe? An unchanging background cannot determine a direction, cannot provide anything which might make for *A*'s priority over *B* or *B*'s over *A*. To be ordered in time, *A* and *B* must be phases of a development or process, or at least be mappable onto one. But, if the events are not simultaneous, surely it must be true that one of them takes place and *then*, whether a long or a short time later, the other follows? But how are we to give substance to *then*? If the two events occur against a background of change, we may be able to say that one of them occurred as e_1 took place, the other as e_2 occurred. But if there is no such background, there is no way in which *then* can pin the supposedly second event down. We have two events, but no sense to saying that one rather than the other occurred first. Possible differences in order, but not in rearrangements of a given order. So we can still distinguish *ABC* from *ACB, BAC, BCA*, and *CBA*, but not from *CBA*.

It might be objected that if we were there to experience the two flashes, we should know which was first. Yes, but if we were there it would be we who, with our enduring but changing consciousness, provided the necessary change for an ordering to be possible. This does not make temporal ordering subjective; it is just that we now have with our thoughts one of the multitude of successions on which temporal precedence may be grounded.

If the argument of this chapter is correct, the account of temporal precedence in terms of a transition from one phase of an event to another tells us much more about time than did any of the analyses which rely on such concepts as those of the past and the future, concepts which are now definable in terms of precedence itself, as with '*x* is past' if and only if *x* is earlier than some point deemed present. It is an account which fits smoothly into the relationist's scheme, the direction of earlier to later being a feature of changes or events, and having no reality without them. That scheme compares favourably with the absolutist's conception, where we have somehow to find temporal ordering inherent in points or instants with an identity which owes nothing to extended periods of which they are the termini. Finally, the dependence of the direction of time on the direction of change means that temporally asymmetric phenomena, such as causation, are not to be taken to reflect an asymmetry in time itself. That would require us to reverse the dependency. Similarly, it is only by projecting features of temporal processes onto time that we might think of it as anisotropic. That is, there is a direction to time only in so far as there is a direction to events and processes in time.

3

Time and Tense

Without clocks much of what we say about time would lapse: no six o'clock, nor any other times: no high noon, no one minute's silences, no early opening hours. But, unwelcome though this may be for those who consider a B series of times fundamental, this is not to say that there would be no temporal reality, that our temporal terms would become one and all unserviceable. 'When', for instance, could still be used in specifying, not the time at which an event occurred, but an event with which it was contemporaneous. So, not 'She arrived at the first stroke of midnight', but 'She arrived just when (or: as) it started to drizzle'. And, while events would not be said to go on for a time, they could still go on, as when a party is said to continue until dawn. The dependence of the metrical concepts on a system of time-keeping might be invoked to explain a sense in which time is an artefact, and therewith a sense in which it can be deemed unreal. This would not, I should say, be an appropriate construal, but whatever is said here, the reality of time in its non-metrical determinations would remain untouched. However, it is the reality of time in this guise that, perversely, has so often been challenged, temporal relations given by a system of dates being accepted unquestioningly.

The only significant issue which I discern here concerns the fundamental concepts of *duration* and *persistence*, as will be discussed at a later point: do duration and persistence have any reality in the absence of all change? However, time has been held to be unreal even in a world in perpetual flux, and it is this less than promising candidate for unreality that we shall consider in this and following chapters, beginning with an account which is geared to time's supposed unreality, namely, the tenseless theory of time. That theory will provide an introduction to issues ranging from the significance of perspectival considerations to the question of the reality of sensory qualities. The latter is of relevance, in that some have thought that such qualities provide a model for our understanding of the seemingly very different

temporal notions. We may have thought it absurd to harbour doubts about the reality of the present, the flow of time, and the temporally asymmetric character of causation, but we now know, it is claimed, that our equally entrenched views concerning the reality of colours, tastes, and smells are in error. In both cases we have to do with perspectival or observer-dependent phenomena rather than objective features of reality (cf. Grünbaum 1971; Price 1996: 156, 158). Exposure of the flaws in this way of thinking will provide a useful complement to our discussion of the perspectival character of temporal judgements.

3.1 INDEXICALITY AND TENSE

We have already noted two ways in which temporal items may be ordered: the ordering may proceed in accordance with the A-series determinations, *past, present*, and *future*, or we may invoke the B-series ordering defined by '*x* is earlier than *y*'—together with '*x* is later than *y*', and '*x* is simultaneous with *y*'. A belief in the reality of temporal passage is often taken as implying that events which lie in the future will eventually become present and then recede into the past. In opposition to this view, which assigns a central place to the A series, the so-called 'tenseless' theory of time contends that we can dispense with the notions of past, present, and future and that the relation of temporal precedence, incorporated in tenseless statements of truth conditions, suffices for the expression of temporal facts. So, we may think of all events as enjoying a temporal location, at least in some sense, and as preceding or succeeding one another depending on that location, but if we adopt a standpoint within this array of events which would allow us to speak of some as future, others as present, and others as past with respect to that standpoint, then we are no longer speaking of how things are objectively, or in reality.

If earlier arguments are correct, the tenseless theory could involve no more than a decision to prescind from the larger picture; there can be no question of rejecting as misconceived what is left behind—the relations implicit in *past, present*, and *future*. Certainly, this is so if the tenseless theory is correctly described as presenting a static conception of the universe, a conception which denies the reality of change. The relation of temporal precedence can be taken as ordering times, events, or both. Times we have seen to be secondary, and in any case to rest on a system of events, and events are particular instances of changes. To analyse '*A* is earlier than *B*' as '*A* is past

when *B* is present' may introduce notions too close to those being analysed to be illuminating, but the equivalence is none the less *correct*, so at odds with any attempt to exclude the concept of the past. Moreover, our account of temporal precedence in terms of a transition from one state to another explicitly introduces the concept of change. There is also the point, made by McTaggart, that, if a series of events is stripped of its tense determinations, we should not be left with a B series, since there would then be no justification for describing the order relation between the events as one of specifically *temporal* precedence. In place of the relations of 'earlier than' and 'later than' we should, he suggested, be left with the relations 'included in' and 'inclusive of' (McTaggart 1927: 31; cf. Craig 2001a).

In current versions of the tenseless theory, no claim is made that we may translate all our tensed statements into exclusively B-series terminology, but it is held that what we fail to capture with this terminology is not in the realm of the factual or objective. Take the statement, 'The meeting adjourned'. This is true if and only if the adjournment takes place prior to the making of the statement, where 'is' and 'takes place' are understood timelessly. We introduce a reference to temporal ordering with 'prior', but no indication is given as to whether the meeting is in the past, the present, or the future. Such information, it is held, has no place in a scientific account of the world. Science seeks to determine how things are in themselves, and not merely as envisaged from a particular human perspective, and nothing is in itself past, present, or future. True, science may appear to be concerned with changes, but change as involving the passage of time may be discounted, not simply because of the perspectival view which it requires, but, for some at least, because such passage is inherently contradictory.

It is not only the concepts of past, present, and future that are supposedly infected with subjectivism or even incoherence, but these are joined by numerous other terms which convey a temporal perspective, most notably indexical or token-reflexive expressions such as 'now', 'soon', 'lately', and 'already'; that is, terms whose reference is determined largely, if not exclusively, by the context in which they are used; the temporal context with this selection, the spatial context with others. We shall now give some attention to this important category of expression.

The pattern displayed by 'now', along with other non-temporal indexical expressions, as 'you' and 'there', is a pattern which permeates the language and is one of much greater import for a very general notion of reference than is found with proper names or uniquely identifying descriptions—the

usual philosophical paradigms of referential expressions. The pattern in question exploits the consideration that, in the vast majority of conversational exchanges, there is one locational datum which will be common knowledge, namely, the spatio-temporal position of the speaker, a position which is thus suitably invoked in determining the reference of various spatial and temporal terms. More precisely, the interpretation of spatial terms revolves around the location of the speaker, whereas with temporal terms it is the time of the utterance that provides the fixed point. To take just the latter, 'tomorrow' is used with reference to the day following the utterance of 'tomorrow'; with 'soon' the speaker specifies a period of short duration after the utterance of 'soon'; the indication of past tense with a verb, as with the termination '-ed' in 'located', is a matter of past with respect to the utterance of that verb form, and likewise with the other indications of tense. In all cases a relation is signified, with the time of utterance, or inscription, providing one term of that relation. The indexical character of such terms and terminations is familiar enough, but worth a reminder for the way it makes use of a single, simple, principle. Given an understanding of such a form, we need know no more than what is usually evident, viz. the time or place of its utterance, to arrive at the intended reference. Close your eyes to this general feature and you will fail to appreciate the most common way in which reference is secured—and secured in an elegant and economical fashion.

Consider Prior's well-known example of the expression of relief, 'Thank goodness that's over!', offered to show the impossibility of translating tensed into tenseless statements. This, Prior argues,

> certainly doesn't mean the same as, e.g., 'Thank goodness that date of the conclusion of that thing is Friday, June 15, 1954', even if it be said then. (Nor, for that matter, does it mean 'Thank goodness the conclusion of that thing is contemporaneous with this utterance'. Why should anyone thank goodness for that?)
>
> (Prior 1959: 17)

We may agree that synonymy cannot be claimed for either form, but does that put paid to the view that the present-tense 'is' furnishes the appropriate temporal reference point, that one who hears 'Thank goodness that's over!' learns from the tense of the verb that the person is ostensibly relieved that the episode has reached its conclusion as he speaks? We may in general be puzzled why anyone should be pleased or relieved that the termination of some state is contemporaneous with an utterance, since there is in general no evident significance in the coincidence of the two, but there surely can be

significance when—as is the whole point of the account—the termination coincides with one's *present* utterance: it is over *now*, as I speak. True, it would be redundant for the speaker to add 'as I speak', but that only confirms the claim that the relevant reference point is given with the utterance of the present-tense verb.

A word about meaning and truth conditions. Although an important aspect of the meaning or use of, say, a past-tense verb-inflection is conveyed by saying that it is a matter of past with respect to the utterance of the verb, this explanation does not issue in a verbal form that is synonymous with what is being explained. Compare the explanation of French *tu* which alludes to the pronoun's character as a mode of address with relations, close friends, children, and animals, or the explanation of 'though' which expands on the kind of contrast which this marks. In neither case do we come up with a word or phrase which might have the same role as the explanandum, but for that a personal pronoun and conjunction respectively would be required. Such a divergence may also prevent an accurate statement of truth conditions from furnishing a synonymous form of words. The truth conditions of 'The square of -2 is positive' can be stated as 'There is one and only one square of -2 and it is positive', but the role of the definite article is not thereby captured by the explicitly existential phrase, the appeal to truth conditions not being sufficiently nuanced to account for the difference between the article and 'there is'. Or again, take a declarative sentence—'I did not know what to do'—and consider the difference in the message conveyed if we preface this with 'besides', 'all the same', 'none the less', 'of course', or 'alas'. No impact on truth conditions when one of these is introduced, but recognizable differences in the messages conveyed.

For our purposes, the crucial consideration is that two forms of words may have the same truth conditions, yet not agree in what they communicate. We have just given the example of sentence adverbs, and there are more familiar instances with conjunctions: what is conveyed by 'He is a mathematician and he is good at philosophy' is evidently not the same as is conveyed by 'He is a mathematician but he is good at philosophy'. Other pairs might be 'We are not at Heathrow' and 'We are not yet at Heathrow', or 'Heathrow is worse than Gatwick' and 'Heathrow is even worse than Gatwick'. Similar examples are provided by 'still', 'already', and 'indeed'. Somewhat differently, but still in the domain of meaning, we have differences which come with word order and intonation patterns. There are prosodic contours indicative of incredulity and uncertainty, and in French a difference in the order of adjective and noun

depending on whether the adjective can or cannot be expected to apply, given the meaning of the noun. For reasons to do with negatability—explained in Rundle 1990: §8.3—differences in truth value are, over a large range of cases, insufficiently sensitive to differences in meaning, an insensitivity which arises with respect to distinctions of tense, where the appeal to truth conditions does not provide a basis for discriminating between the simple past, 'We met', and the perfect, 'We have met'. Replacing the one by the other will often result in awkwardness, but an awkwardness that falls short of falsity. Likewise with 'We shall wait' and 'We shall be waiting'. More subtly, we have differences in tense to be found in conditionals, as with 'If the stock market falls tomorrow, I shall lose a fortune' and 'If the stock market fell tomorrow, I should lose a fortune'. That the differences here are not subtle to the point of non-existence is argued in Dudman 1984. See also Rundle 1990: 238.

Is the concept of a difference in tone of relevance here? Michael Dummett describes Frege's category of tone or colouring as a 'ragbag'. This is too kind. There are pairs of words which agree in reference—'child' and 'bairn', 'dog' and 'bow-wow', 'measles' and 'rubeola'—at the same time having a dimension of difference which might be described as 'tonal', one of the pair being standard, the other dialectical, baby talk, technical, slang, obscene, euphemistic, genteel, and so forth. 'And' and 'but' do not conform to this pattern, but the way 'but' has meaning is as with words which have no special tone, the difference between the two in the relations signified being overwhelming compared with any sameness. Indeed, the pair could be said to be closer to 'on' and 'off' than to such a pair as 'yes' and 'aye'. Likewise with 'We met' and 'We have met', or 'We shall wait' and 'We shall be waiting'. Replacing the one by the other may not result in a change in truth value, but the difference between them is quite unlike that between 'over' and 'o'er' or 'insane' and 'bonkers'. For further discussion see Rundle 1990, §1.4, ch. 8, where reasons are also given for not tying truth and meaning too closely together.

Although I have been talking freely of *reference*, in the case of temporal terms the notion has to be handled with care. Thus, since, in the pre-metrical situation, 'now' is not to be taken as referring to a time, and since the introduction of clocks would not appear to result in a change in our understanding of the word, its interpretation as always referring to the present moment is questionable even with respect to our more fully developed language. According to Martin Davies, 'If a speaker uses "now"... in an

utterance, then it is not sufficient for understanding of that utterance that an audience should merely know the meaning of the sentence uttered. He must be able to identify the time . . . of the context of utterance; only then will he know what has been said' (1983: 132). This is acceptable, but only if 'time of utterance' covers 'occasion of utterance' as well as clock times and dates. If someone asks, 'Are you ready now?', we can surely understand the question without knowing what time it is. It is a matter simply of whether or not you are ready as the person speaks.

In the use which concerns us, 'now' often duplicates the indexical element given with the present tense. In 'I now know who did it', 'now' offers a focus for various contrasts—I did not know it before, but I do now—but beyond that it does no more than make explicit what is implicit in 'I know who did it'. In saying this, I do not wish to play down the significance of adding 'now', which becomes plain when we consider contexts in which it is not appropriate. The midwife may announce 'It's a boy', but not 'It's now a boy', there being no place for the alternatives which would give point to the 'now'. By contrast, its omission from the injunction 'Write to her now' leaves room for other possibilities, as 'not later'. However, the main point is that in examples of these kinds utterance of 'now' *itself* furnishes a point of reference, a fixed point to which other happenings may be related, rather than that 'now' itself refers to anything: not to a time, let alone to itself, as some accounts of 'now' as a 'token-reflexive' would have it.

It is tempting to argue that this account of 'now' gains some support from a comparison with marks of tense. The termination '-ed' signals being past with respect to the utterance or inscription of the termination. That is a matter of past with respect to the present, but the termination is not called upon to *refer* to anything. And it is true that the behaviour of 'now' is adverbial rather than nominal. Saying that the postman is approaching now is not saying what he is approaching—it is not like 'We are approaching the millennium'—but even with 'Now is the time to act' the 'now' is an adverb. The sentence equates to 'The time to act is now' which purports to tell you when, not what, the time to act is. Compare 'soon', which, like 'now', and unlike 'the millennium', may follow an intransitive verb—'She will be with us soon'—and may precede the verbal phrase—'Soon she will be with us'. Or again, take 'here'. In stating 'Here is a receipt' we are not saying of something named 'here' that it is a receipt, but the role of 'here' is adverbial: 'A receipt is here'. Our certain knowledge as to when the postman is ostensibly

approaching is dependent not on the impossibility of reference failure on the part of 'now', but on the provision by the speaker of an utterance with which the postman's behaviour may be contemporaneous. Again, to say of an event that it took place *then* may be elaborated by specifying the time in question, but in general it is to direct one's audience to another happening with which the event supposedly was or will be concurrent, as when the reference in 'He will then be eligible for retirement' might also be given by 'when he reaches the age of 65'. Or again, the relevant happening may be one which preceded or will precede the episode reported: 'She drew the curtains, then turned on the light'.

However, the adverbial behaviour of 'now' and 'here' is not enough to show that they do not refer to anything. We are not saying of something named 'here' that it is a receipt, but that does not mean that 'here' is not used to refer to or single out some spatial region. It is rather that what is singled out is not the subject of a predication, not something of which 'is a receipt' is affirmed. Compare the use of phrases like 'next month' or 'the following year', as in 'He will resign next month' and 'She will return the following year'. These are not the objects of the verbs 'resign' and 'return', but they can none the less be said to have a referential role. On the other hand, it is a role with its own peculiarities, as we see from the possibility of such elaborations as 'on the table', 'by the wardrobe' and 'in 1955' for 'here', 'there', and 'the following year'. Might we not add to this list the reading of 'now' as 'as I speak'? The comparison of 'now' with marks of tense appears apt to the extent that any use of *reference* with respect to either is not as with the paradigms of proper names and definite descriptions. On the other hand, if we allow that 'as I speak' may often replace 'now', are we not departing from our account in terms of the mere *production* of 'now'? For reasons indicated when speaking of meaning and truth conditions, I do not wish to go so far as to equate the two forms of words. They do much the same job, but the clause does it more explicitly. Perhaps it *says* what 'now' *shows*.

Occasionally, the appropriate interpretation of 'now' is to be sought in some context other than that in which the word is uttered or written, as with 'The troops were now approaching the city' or 'He now knew why there had been no reply'. (Not in Latin, which would use *iam*— 'already'—rather than *nunc*—'now'.) In this use 'now' comes close to 'then', though it tends to convey the perspective of someone in the relevant setting. A parallel use is to be found with 'here'. One who says 'It was here that the first settlements

were found', need not be referring to an area in his vicinity, but to a region, possibly quite remote, that has already been identified, the identification being one which would also license 'in this place'.

3.2 SUBJECTIVITY AND PERSPECTIVE

It is often maintained that past, present, and future are not characteristics intrinsic to events, but are relative to a speaker. Does this introduce an element of subjectivity? Ayer writes:

> events are not in themselves either past, present, or future. In themselves they stand in relations of temporal precedence which do not vary with time . . . What varies is only the point of reference which is taken to constitute the present.
>
> (Ayer 1956: 152–3)

Richard Gale reads a suggestion of arbitrariness or subjectivity into Ayer's use of 'taken', as though we had a choice as to what point to deem present, whereas Ayer may have had in mind merely that we took different such points at different times. Certainly, we can agree that, since an event may be yet to come, then be present, then recede into the past, it will not in itself be past, present, or future (Gale 1964: 220). That the point of reference should be characterizable in terms of the speaker's spatio-temporal location is understandable for the reasons given above in explaining the utility of indexicals. But not only does that not introduce an element of subjectivity, in a sense that would make the passage of time unreal, but other reference points can be selected, as is customary with 'then', and which may, as just seen, even be the case with 'now'.

The rejection of objectivity is more forthright in these passages from Russell and Smart:

> In a world in which there was no experience there would be no past, present, or future, but there might well be earlier and later.
>
> (Russell 1915: 212)

> If I am right in supposing that 'now' is equivalent to 'simultaneous with this utterance', then I am able, as we have seen, to reject the notion of an objective 'now', the notion that even in past ages when there were perhaps no sentient beings there was nevertheless a moment which was distinguishable as 'the present' or 'now'.
>
> (Smart 1963: 137)

And, from a very different tradition:

> the very notion of an event has no place in the objective world. When I say that the day before yesterday the glacier produced the water which is passing at this moment, I am tacitly assuming the existence of a witness tied to a certain spot in the world, and I am comparing his successive views . . . Change presupposes a certain position which I take up and from which I see things in procession before me: there are no events without someone to whom they happen . . . Time is, therefore, not a real process, not an actual procession that I am content to record. It arises from *my* relation to things.
>
> (Merleau-Ponty 1962: 411–12)

As just noted, there is a use of 'now' in which it may single out a past time, and there is no need to suppose sentient beings around at the time in question; the phrases 'the then present' and 'a past present' can likewise single out any past time whatsoever. The use here of 'time' is not tied to the availability of clocks, but it compares with 'period', 'era', or 'occasion'; it may have its reference fixed by such a clause as 'when this tree was first struck by lightning'. True, we may have some sympathy with these writers, in that the only being that can *have* a temporal perspective is a conscious being, but this is a narrower condition than is required for an allowable use of 'then' or 'a past present'.

Adolf Grünbaum considers Smart's linking of 'now' with utterances too restrictive (1971: 210), and proposes in addition that it may 'designate a particular content of conceptualized awareness', a construal having the consequence that 'nowness is mind-dependent'. Taking as his example of a temporal proposition, 'It is 3 P.M., E.S.T. now', he claims that if 'now' does not here involve reference to a particular content of conceptualized awareness or to the linguistic utterance which renders it at the time, then

> there would seem to be nothing left for it ['now'] to designate other than either the time of the events already identified as occurring at 3 P.M. E.S.T. or the time of those identified as occurring at some other time. In the former case, the initially informative temporal judgement 'It is 3 P.M. E.S.T. now', turns into the utter triviality that the events of 3 P.M. E.S.T. occur at 3 P.M. E.S.T.! And in the latter case, the initially informative judgement, if false in point of fact, becomes self-contradictory like 'No bachelors are males'.
>
> (1971: 211)

The use of 'now' envisaged would appear to be one to which the present account applies, so where questions of reference to events may be bypassed.

However, leaving that aside, it would not appear that the relevant events have to be identified *as* occurring at any time. An event concurrent with an utterance of 'now' which might be offered as its referent need not be given to the speaker as occurring at 3 p.m., but the clock's saying 3 p.m. is another event found to be concurrent with that independently identified happening. It is a further fact about that event that it does or does not occur at that time.

However, while we may query the argument advanced by Grünbaum, there is a consideration which gives some support to his general position. I say that 'the then present' or 'a past present' can single out any past time whatsoever. This appears to leave the phrase as unproblematic as is 'then', but what does speaking of a present add to speaking merely of a time or occasion? Past and future are readily understood with respect to a given event, or point in time, a matter of what preceded and what followed, and we can speak of numerous events as being co-present. But one such event is not present to or for another. That relation comes about only when you have a person, or perhaps sentient being, as one of its terms. The present rain is rain of which someone is or could be presently aware. Does this make the present subjective? Not, I should say, in any troublesome sense. Whether something is or was present, now or at an earlier time, remains an objective issue just as much as whether certain events happened before or after that point. We allow only human beings as second terms of the relation '*x* is present to *y*', but that is also the case with '*x* amused *y*', '*x* is *y*'s banker', and '*x* blackmailed y'. With these, and innumerable comparable relations, we are dealing with possible matters of fact.

Dummett considers that facts concerning past, present, and future are facts into the statement of which temporally token-reflexive expressions enter essentially, whereas the use of spatially token-reflexive expressions is not essential to the description of objects as being in a space. He explains:

> I can describe an arrangement of objects in space although I do not myself have any position in that space. An example would be the space of my visual field. In that space there is no here or there, no near or far: I am not in that space. We can, I think, conceive, on the strength of this analogy, of a being who could perceive objects in our three-dimensional physical space although he occupied no position in that space.
>
> (Dummett 1960: 354)

On the other hand,

> Suppose someone who can observe all events which take place in our universe, or some region of it, during some period of time. . . . Then even if he knows both what

he has observed and what he is going to observe, he cannot give a complete description of his observations without the use of temporally token-reflexive expressions. He can give a complete narration of the sequence of events, but there would remain to be answered the question, 'And which of these events is happening *now*?'

(Dummett 1960: 354)

These passages prompt a number of queries. First, is the notion of a complete description legitimate? Need there be a limit to the descriptions that can be given of the physical universe in all its vastness? Second, Dummett makes a transition from what is possible with respect to *a* space—we can certainly describe an arrangement of objects in a space in which we ourselves are not to be found—to what is possible with respect to three-dimensional space generally. Conceiving of a being outside space altogether yet able to observe its occupants is surely problematic. Moreover, if such a being can be said to observe a group of objects, he will surely have to view them from a standpoint, so that one house, say, will be to the left of another, or in front of a tree, and so forth—relations which, we might add, seemingly also hold for one's visual field. If this is so, then the element we sought to get rid of is still with us, but coupled with an additional difficulty: we are required to make sense of a disembodied observer contemplating this disposition of objects. However, setting aside any difficulties posed by such an observer, what are we to make of the question, 'And which of these events is happening *now*?'? Suppose the question is put in Oxford on May Day 2004. If the description given is complete, it will have covered the relevant events, but it could be that the interlocutor is unable to relate their description to the time in question; equally, however, he may be unable to relate the description to his present location, and might well enquire, 'And which of these events is happening *here*?'. True, what matters is not so much what is or is not apparent to the person, as whether the description specifies what is happening at the time and place of his query, and whatever 'completeness' means, it surely implies adequate coverage in each respect. Moreover, it does not require use of token-reflexive expressions to ensure the completeness of the description of his observations, but their time and place can be identified in other ways; notably, as occurring in Oxford on 1 May 2004.

The loss of information that comes with the detensing of verbs has its parallel with spatial relations. It may be supposed that the two differ, that spatial relations can be fully given without betraying a particular spatial perspective, and that this makes for a difference with time: we shall not know whether the happenings depicted are past, present, or future unless

we know their temporal relationship to the time of speaking. However, such forms as '*x* is behind *y*', '*y* is to the left of *z*', and '*x* is a mile to the north' presuppose a matching spatial perspective. The spatial possibility is interesting in bringing out the vacuity of the relations which remain when the perspectival information is stripped away, relations such as 'is behind' having to give way to 'is behind or in front of, to the left or to the right', and so forth. But suppose we locate objects on a grid, with direction given only by the points of the compass. Then, surely, we can stay out of the picture altogether. But is that not matched by a system of dates, or is the latter in some way dependent for its interpretation on egocentric, observer-dependent considerations? It is dependent on the selection of particular events onto which, e.g., the origin of the timescale is mapped, as 15 BC, but this is no different from the dependence of points of the compass on the whereabouts of geographical features, such as the poles.

The converse position has also been argued: a spatial relation such as 'south of' tacitly involves a relation to a third term—as a point of the compass—whereas a temporal relation, such as 'earlier than', contains no comparable reference (Broad 1938: 258). But 'earlier than' achieves this status only by being denied the completion which its use in a sentence would involve, viz. a tensed form of the associated verb, as in 'was earlier than', which introduces a comparable fixed point in the form of the time of utterance.

There is a further strand to Dummett's notion of a complete description, a complete description being for him one which is observer-independent. If anything is real it must be possible to give a complete description of it, but since token-reflexivity cannot be eliminated from an account of time, time must be unreal. It is not clear that 'complete' is the right word for Dummett's purposes. A description geared to the location or perspective of an observer is not shown thereby to be incomplete; on the contrary, if it fails to communicate that relation it is so describable. Again, observability, as of the moon, is always observability from some place at some time, but is observability thereby shown to be an 'unreal' feature of the moon? Explaining how events are related to an observer need not make anything observer-*dependent*—a point which we shall elaborate in the next chapter—even though it is information that a complete description requires. So, we may say that the person wished to know what events were happening then, at the point when he raised the question. A complete account would have told him, though, depending on the terms in which it was couched, it might or might not have been appreciated as giving that information.

Consider again the position of those who accept the ordering of events given by the B series, but who will not admit the reality of the A determinations, of the division into past, present, and future. Given this ordering, what more, we may wonder, is needed to make sense of 'now'? Taken in the broad sense just considered—where it may apply in past presents—it is surely no more problematic than is 'then'. In either case it is simply required that a suitable time or event be selected in reference to which concurrent events may be specified. If the narrower use is envisaged, then a narrower range—that of a present time, utterance, or other happening—will provide the point of reference. Where is the difficulty?

A comparison of 'now' with 'I' can be illuminating—though perhaps more for the light it throws on the latter, which is the more problematic. To all appearances, 'I' enjoys a referential function which fits neatly into the scheme appropriate to other indexical expressions. Just as the person referred to by 'you' is the person to whom the utterance of 'you' is addressed, so the person referred to by 'I' is the person who utters 'I'. While the lack of a contrast which 'misidentify' would provide seems to deprive 'identify' of a role in this connection, use of 'refer' appears less open to question. Indeed, the suggestion that in saying 'I . . .' a person might not be referring to himself appears highly counter-intuitive: if someone, John Smith, says 'I am tired', and he is reported by 'John Smith said he was tired', then the same reference is seemingly being picked up by the name and the pronoun 'he' as was given with 'I'. On the other hand, it may be held that the pronoun in 'I am tired' does not have to *refer* to the person speaking, but as coming from a particular mouth or body it *shows* who claims to be tired, draws attention to the person in question. Thus, just as utterance of 'now' itself provides, rather than refers to, a temporal reference point, so production of 'I' enables others to identify someone, even though that is not what the speaker was doing (see Hacker 1990: 486–93). Compare a language which, like Latin, may forgo the use of a pronoun in conveying first, second or third person, making do with a suitable termination, as with *doleo*, 'I am in pain'. When a Roman complained, '*Doleo*', it would have been clear who was ostensibly in pain, but would that be because he *referred* to himself? It was mentioned above that the termination '-ed' signals being past with respect to the utterance or inscription of the termination, but without being called upon to *refer* to anything. A similar lack of reference may go with the first-person termination in Latin, and perhaps it is only an illusion of grammar to suppose that there is more of a reference when 'I' is employed.

The following parallel is of interest. I say that a name or pronoun may seemingly pick up a reference given with 'I', a consideration which appears to count against denying the latter a referential use. But it may also be thought that, similarly, 'then' may pick up a reference initially given with 'now'. However, if, as suggested, 'now' need not be construed as referential, this description will have to be revised. If you should say, 'We are now approaching the town', we can report you as stating that you were then approaching the town, with the elucidation of 'then' as 'as you spoke' seemingly in place without 'now' having had to refer to that, or any other, episode. The point is of greater service in lifting the threat of paradox with non-referential 'I', the analogous account of 'now' and 'then' being less counter-intuitive. So if 'I' does not make a reference which may be picked up by a use of the speaker's name, we could still, none the less, pick out the speaker as the reference of the name. Note that if we were to say that 'I' had both referential and non-referential uses, we could continue to point to a parallel with 'now'. It need not refer to a time, but it is not invariably to be denied this role.

These remarks about 'now' are important in evaluating the absolutist's conception. If we object to the idea that the world presents us with points of time not dependent on events for their definition, the absolutist might respond: 'What more do you want beyond the succession of referents of "now"? We do not have to single out points in this way, but they are surely there to be referred to, the possibility of using "now" at *any* time testifying to their existence'. But if utterance of 'now' is by itself sufficient to provide a point of reference, there need not be in addition a profusion of answering points.

Arthur Prior argued against the token-reflexive account of 'words like "now", "then", "ago", "present", "past", "future", and the various indications of tense' on the grounds that there are happenings which 'were future and became present and then became past . . . without anybody saying so or being there to say so, i.e., without there being any utterances for them to be contemporaneous with or earlier or later than' (1968b: 20). It is of course true that a happening can be past, present, or future relative to some date or some event, not necessarily an event of saying something, but then surely no one wishes to claim that *every* temporal term has an indexical character. In 'When Harry met Sally, he had already moved house', 'met' locates the time of the meeting as past with respect to the utterance of 'met', but while 'had already moved' enjoys a similar role, the meeting provides a further point of reference to which the house moving is supposedly prior. Again, 'moment'

and 'month' are not indexical, but there is surely no denying such character to 'yesterday', 'today', and 'tomorrow'. And, indeed, it is noticeable that Prior does not even attempt to make out a case against the indexical character of most of the items in his introductory list.

Prior's observation with regard to happenings which become present is to the point, but he himself indicates how 'present' and 'now' may differ in terms of their relation to utterances:

> In 'It will be the case tomorrow that my sitting down is present,' the presentness referred [to?] is a presentness that will obtain tomorrow, i.e., at the time to which we are taken by the tensing prefix. But in 'It will be the case tomorrow that I am sitting down now,' the word 'now' indicates the same time that it would indicate if it occurred in the principal clause—the time of utterance.
>
> (1968a: 104)

It would be remarkable if there were just one way in which temporal indicators operated. The indexical role is not universal, but there are uses of such indicators which conform to the use of indexical terms generally, tense inflexions being perhaps the most important amongst them. As we shall shortly see, the appropriate response to those who make indexical features of language part of their programme of dispensing with tense is to challenge the inference which they draw from a reliance on this feature to the unreality of time. Indexical character itself can be readily granted.

3.3 TENSE AND TENSELESSNESS

Indexical expressions are often invoked in giving an account of tensed sentences which achieves something of the goal aimed at, but missed, by the suggested translations into dated forms plus tenseless verbs. As mentioned above, it is not held that tensed forms can be translated into corresponding tenseless versions, but it is claimed that the semantics of tensed expressions can be expressed in a tenseless metalanguage (Smart 1980); that is, there is no need to enlist tenses when stating the truth conditions of tensed sentences, but only unchanging relations of being simultaneous with, earlier than, or later than, need be invoked. While I regard indexical expressions as central in our temporal vocabulary, I do not wish to make them part of any such programme, for reasons already touched upon, but which will now be elaborated (cf. Lowe 1998: 45).

First, a further word about indexical expressions. One obstacle to the translatability of tensed into tenseless sentences is commonly thought presented by the ineliminability of certain indexical terms, as seemingly demonstrated by John Perry. With respect to the use of 'now', Perry invites us to consider the following example: 'a professor, who desires to attend the department meeting on time and believes correctly that it begins at noon, sits motionless in his office at that time. Suddenly, he begins to move. What explains his action? A change in belief. He believed all along that the department meeting starts at noon; he came to believe, as he would have put it, that it starts *now*' (1979: 144). This indexical is essential, Perry claims, in that replacement of it by other terms 'destroys the force of the explanation, or at least requires certain assumptions to be made to preserve it' (1979: 144).

The professor 'came to believe, as he would have put it, that it starts *now*'. How might *we* have put it? Clearly, there is no replacing 'now' by 'at noon', but equally clearly, it can be replaced by 'then' in our report of the professor's change of belief, and there is no bar to further elaborating the reference of 'then' in terms of a happening concurrent with the man's realization, and known by him to be such. What we want is not a time, such as 'at noon', but something *in* time, as given by, say, 'as he was lighting his pipe'. To make this criticism is not to query the centrality of indexical features of language; only to query whether any particular indexical is essential.

A further manageable objection concerns the truth conditions of tensed utterances. On the token-reflexive theory, the truth conditions of 'There is no spoken language' come out as 'The utterance at time *t* of ''There is no spoken language'' is true iff there is no spoken language at *t*—the time of this very utterance', which entails that 'There is no spoken language' is *necessarily* false. But of course: it is necessarily, inescapably, inevitably false, just as 'I can speak' is necessarily true, bound to be true when uttered. This is where the necessity resides: a matter of truth or falsity *when uttered*. A *necessitas consequentiae*, not a *necessitas consequentis*—a relative rather than an absolute necessity. Because of its relation to speech, the very utterance of the words guarantees their truth or falsity. But this is not to say that it is necessarily false that there should have been no spoken language at the time these words were in fact uttered, nor that it is necessarily true that I can speak. Compare the following. We can say that you are a humble genius, but it is questionable whether you can consistently say 'I am a humble genius'. But this does not mean that it is a logical truth that you are not a humble genius, even if it is logically true that *if* you say you are, your words belie what you say.

Back to tensed and tenseless forms. A sentence in the past tense, as 'The continents separated', is readily enough associated with a tenselessly given truth condition: ' "The continents separated" is true if and only if the time of the continents' separation is before the utterance of these words'. We have made use of the verb form 'is' in this translation, but this can reasonably be construed timelessly, as befits the specification of truth conditions appropriate to 'The continents separated' as a sentence *type*, a type which embraces utterances or inscriptions at any time, past, present or future. Similarly, the tenseless advocate may hold that, say, 'The children are now asleep' is true if and only if its production in speech or writing is simultaneous with the children's being asleep. If such a relation holds, it holds at all times, and the 'is' in 'is simultaneous' can accordingly be construed tenselessly to yield a timeless specification of truth conditions. However, this is to explain how 'now', or the present tense, fixes the time reference, and the tenseless character simply reflects a concern with statements of the given form whenever made, whether in the past, the present, or the future. There is no failure to differentiate from other reports of the same state of affairs, as with 'The children were then asleep', but someone who clung to the ineliminability of tense could be happy with this account.

Consider now a particular utterance of 'The continents separated', say one issued at some point in the past. We need not find fault with the given specification of truth conditions, but 'is before' could appropriately give way to 'was before'. We can, should we wish, continue to use the timeless form, but, clearly, without prejudice to the correctness of '*was* before'. Understood timelessly, 'is before' is indifferent to its particular tensed realizations, as 'was before', 'is before', and 'will be before', but one of them will in general be in place, and a failure to be specific as to which that is does not mean that considerations of tense have been eliminated in any interesting sense; they have simply been ignored. Utterance of 'The continents separated' could occur in the past, the present, or the future. Use of 'was before' conveys the ostensible fact of a past occurrence, whereas timeless 'is before' passes over this fact. Given that such a phrase has to answer to such a fact, it is wrong to say that there is nothing in reality beyond what is conveyed by tenseless truth conditions.

But the detenser's challenge has not been fully met. Consider further ' "The continents separated" is true if and only if the time of the continents' separation is before the utterance of these words'. We accept this as giving the truth conditions of the sentence, but note that it is silent on the crucial matter

of whether the utterance is past, present, or future. However, if it is a matter of 'is before *this* utterance', the token rather than the type, the utterance being produced then and there, not 'is before *an* utterance of these words', then we have indeed narrowed what is being affirmed down to the present. On the other hand, if that is how we understand 'this utterance', viz. as 'the present utterance', then we have smuggled in an invocation of the present which the detenser cannot allow. Again, if it is a matter of a past utterance we can use tenseless 'is before', but we shall have in some other way to convey its pastness. And we might wonder whether 'is before' can be innocent of all implications of tense. Certainly, if 'tenseless' is simply an umbrella term for a disjunction of the three tenses—past, present, and future—it is clear that tense has priority over tenselessness. But need the detenser go along with this disjunctive analysis? If, as with the use of 'is' in definitions—'A crustacean is a shellfish'—there is no question of a contrast between 'is', 'was', and 'will be', then that analysis is not in place, but if 'is' is used with respect to objects and events for which there is such a contrast, it surely can be replaced by the disjunction.

There are other challenges to the detenser, but we are not necessarily at odds with him on the matter of truth conditions, as indicated with respect to 'The continents separated'. It is, rather, that there remains something conveyed by the original which lies outside such a specification, viz. the speaker's temporal relation to the state of affairs affirmed, and it is only at the cost of reintroducing A-series notions—which the intention was, of course, to exclude—that we can make good this deficit. What is questionable is not so much the adequacy of the detenser's translations as the conclusion that he draws from their possibility, namely that we have no need of the notions of past, present, and future when specifying truth conditions of tensed propositions, so no need of facts about past, present, and future which might make such propositions true. Take a possible statement of present fact, say, 'The students are protesting'. The description, 'present fact', remains apt even if we can give the statement's truth conditions in the form prescribed, since all we shall then be doing is relocating tense in the notion of the present utterance rather than in the verb, a redistribution of roles which yields the same overall thought as the original. It has to be that way if the translation is to succeed, but it is then difficult to see how the one can be factually or objectively true, the other not.

What if the objection is not that there are no tensed facts, but that these are not *needed*; tenseless facts are by themselves sufficient? But again, in so far

as the tenseless forms do justice to the tensed propositions, the required facts will be as inescapable in the one case as in the other. Consider an utterance of a past-tense proposition, say, 'The students protested'. You cannot coherently say that it does not need to be a fact that the students' protest was in the past, that it is enough that the protest should be before these words for them to be true. At the very best, the timeless form might be a variant we could use, but it would still have to be a fact that the protest was in the past if that variant is to be acceptable. Indeed, 'before the speaker's utterance' may often be rendered 'in the speaker's past'. Compare the claim that, since 'His suit has a shabby look' means no more than 'His suit looks shabby', we can do without such things as looks. Certainly, we can, at least in this context, do without the *noun* 'look', but that is not to deny that a thing can be said to have a certain look. Indeed, we could not go along with such a denial without rejecting the suggested equivalence.

It would appear that the difference between those who favour a tenseless analysis and those who demand the retention of tense may hinge on no more than the appropriateness of speaking of the objectivity or reality of what tense conveys, there being otherwise no disagreement about the specifications of truth conditions. D. H. Mellor, for instance, holds that while the truth condition of a sentence in the present tense—'Sarah is asleep', let us say—varies with time, there is no tense in the truth conditions themselves. In this instance, we have that 'Sarah is asleep' is true if and only if Sarah's being asleep is (timelessly) simultaneous with the utterance of these words (1981b: 89). To this we may agree—with the above reservation about lost information—but for Mellor, 'The error is to misread the tense of these judgements as part of their non-indexical content, and hence to see it as an extra, ever-changing aspect of the objective world' (1981b: 89). We may happily grant that the temporal element is part of the indexical content of the judgement, but why should it not convey an extra, ever-changing aspect of the objective world? It is not clear why tense should make for a lack of objectivity; indeed, why objectivity should be denied to every statement which incorporates a tensed verb, so, given the ubiquity of tense, to practically everything that anyone ever says. As noted above, the denial of objectivity to A-series relations appears particularly arbitrary in the light of its affirmation with respect to the B series. The A-series form '*x* is past', for example, can be taken as an instance of the B-series '*x* is earlier than *y*', a matter of *x* being earlier than some point *y* taken to mark a present.

A natural antonym of 'objective' is 'subjective', 'a matter of mere opinion', but when the opposite is given by 'perspectival', there is no implications of purely personal judgement or any defect in the matter of truth. A judgement can surely be reckoned objective if it can enjoy well-defined truth conditions which may be indisputably satisfied when taken in the way appropriate to their sense. That is, it is not to the point to label 'The wedding took place a year ago' as lacking in objectivity on the grounds that it will not be true in a year's time. What is the alternative? That an objective judgement should have the same truth value whenever it is made, so not be responsive to changes in the world? True, our criterion of identity for judgements may mean that what is said in a year's time will not count as the same judgement, but if the earlier judgement cannot change its truth value, that makes a denial of objectivity to it even less inviting. Again, what would it be for past and future *not* to be past and future relative to a present? Some form of relativity is to be granted to many properties and relations, including the basic physical quantities of mass, length, and time. The question is whether subjectivity is thereby implied, and the suggestion here is that, in the sense in which subjectivity is opposed to objectivity, there is no such implication.

Consider the following observations by Theodore Sider:

> When *I* say 'here', it means New Jersey; when my friend says 'here', it means California. Neither place is *here* in any objective sense. California is here for my friend, New Jersey is here for me. The space-time theory says an analogous thing about time: just as there is no objective here, so there is no objective *now*. If I say 'It is now 2005', and in 1606 Guy Fawkes said 'It is now 1606', each statement is correct . . . There is no single, real, objective 'now'.
>
> (Sider and Conee 2005: 51–2)

If Sider is indeed in New Jersey when he speaks of it as 'here', then New Jersey is objectively where he says it is. The perspectival character of the judgement does not make it any less of a fact that this is so, and, indeed, Sider allows that each of 'It is now 2005' and 'It is now 1606', made at the appropriate times, is *correct*. However, in the usage which he proposes, to employ 'here' and 'now' in an objective sense it would not be good enough to use the words in a way that every speaker of the language would judge to be correct, but objectivity would presumably require that '*x* is here now' be true wherever and whenever said. Presumably, too, an objective sense of 'I' would require that one who uttered it be referring to everybody, and an objective use of the indexical adverb 'abroad' would be one according to which everyone lived

abroad. Roughly speaking, an objective truth is in this context a truth that, in principle, can be ascertained as such *by* anybody, not something that has to be true *of* everybody.

What is important here is to dispel any illusion of depth. It is not so much the particulars of the debate that matter, but the more general question as to the nature of that debate. If one party holds that such a proposition as 'I was there' can be objectively true, the other that it cannot, the two are divided on the matter simply of how the phrase 'objectively true' is to be used. In saying this I do not mean to imply that the issue is accordingly trivial, or that the rival positions are equally cogent—'I was there' can certainly be true, and it has yet to be explained how 'objectively true' might differ from the plain 'true'—but we are not confronting a metaphysical issue, an issue which takes us beyond a dispute about language to matters of fact of a mysterious non-empirical character.

What of 'real'? It may be said that what matters for the tenseless conception is not that past, present, and future are, in the relevant cases, relative to the time of some utterance, but that it is a mistake to single out just one of these—the relation which defines what is happening now—as what defines what counts as real. Past, present, and future being all equally real on this conception, in judging only the present to be real we are simply revealing the restricted scope of our knowledge. Reality extends temporally back into the past and forwards into the future, and we err in taking it to be confined to what is given to present awareness. We shall return to this underlying concern.

Our remarks on tenselessness have so far been directed at forms of words used assertively. It is of interest to consider the contrast with non-assertive uses of the same declarative forms, or suppositional uses of words, as 'Suppose there is a black hole' or the first sentence in 'You see someone breaking into your house. What do you do?' The 'is' in 'Suppose there is a black hole' or 'Suppose a black hole is observed' may be timeless in its force, the speaker having no concern to posit a black hole at one time rather than another. Likewise with 'You see someone breaking into your house'. It could well be all one to the speaker whether you imagine such an incident in the past, the present, or the future. If 'There is a black hole' features a timeless 'is', but is uttered as an assertion, there is information to be restored: do you mean 'is now', or is it 'was' or 'will be'? It is a *different* claim that is being made, depending on how this is to be answered, but, understood timelessly, the mere *supposition* need not call for any such elucidation. Note, incidentally,

that a timeless reading may be in place with other tenses. In '*A* is earlier than *B* if *B* occurs when *A* has occurred', we have verbal phrases, 'is earlier' and 'has occurred', which are timeless in the sense that the condition is applicable at any time, past, present, or future.

Compare the claim that no change is implied by facts relating purely to McTaggart's B series, that is, facts concerning the relation '*A* is earlier than *B*' or '*B* is later than *A*'. If such a form is true, it is true at all times, whereas change requires facts pertaining to the A series, facts relating to the past, present, or future status of an event. Here we have genuine change, when we can say, for instance, that some event *A* had ceased to be future and is now present, and will cease to be present and become past. But suppose '*A* precedes *B*' is 'The hot state of the poker precedes its cool state'. Then of course the poker changes. The timeless form is silent on the question whether the states in question are past, present, or future, but whichever they are, we have change: the poker either changed, is changing, or will change from hot to cool. Again, it is said that, whereas positions in the A series change—what now lies in the future will one day be in the past—positions in the B series are unchanging: if it is true at one time that event *A* is earlier than event *B*, then it is true at all times that *A* is earlier than *B*. But this tenseless 'is earlier' does not exclude a tensed expansion appropriate to the particular case, as 'If it was true at one time that *A* was earlier than *B*, then it is true at all times either that *A* would be or had been earlier than *B*'. Conversely, when it is said that an event which is future will eventually become past, this is a matter of an event which is future at some time becoming past at some later time, and these relations are equally unchanging. Note, too, that what is unchanging in the B series is the *ordering* of events. The events themselves, which are said to involve change, are common to both series. A more apt comparison would fasten on *A*'s being earlier that *B*, but it is clear that this may be past, present, or future, so is locatable in the A series. That the distinction between the two series is misconceived is further apparent from the consideration that *x* is earlier than *y* by being past when *y* occurs.

To round off this discussion, in one important respect I am siding with those who advocate tenseless analyses in their dispute with the proponents of tense, in that I hold in common with the former that *past, present*, and *future* are relational predicates. Richard Swinburne has an interesting objection to this construal. He writes:

> If pastness is a relation, then events cannot be 'past' *simpliciter*; they have to be past in relation to something else. And if the only something else which can be provided

(*viz*. "the present") is something described in terms of a relation to something else of which the same is also true, and so *ad infinitum*, the regress so generated is bound to be vicious, because the ascription to an event of a relation is incomplete until the other term of the relation is given by a complete description. But if we say that the pastness, presentness and futureness are non-relational properties of events, we get no vicious infinite regress.

(Swinburne 1990: 119)

If I say 'A storm was then raging', I may elaborate by adding such a clause as 'while we were visiting the museum' or 'as we crossed the border', giving rise to constructions which can reasonably be described as relational. I do not have in turn to relate the visit or the crossing to other happenings to ensure that they were present. Some happening or happenings are simply being taken as defining the then present—those specified in *Q* with '*P* as *Q*'. Now consider a statement in the present tense, as 'A storm is raging'. We may seek to preserve the pattern with the past by adding 'as I speak', but might we not equally add 'as I look out the window' or 'as I stoke the fire'? It is surely through the use of the present tense, 'is raging', that character as present is channelled, with no need to add any further clauses. We may highlight this element by an expansion to 'A storm is now raging'. What justifies use of 'now'? In a sense, nothing. As we have seen, there need be no reference made with 'now', let alone with a mark of tense, so no reference which could somehow fail, or fail to be understood. Rather, we are giving, producing, a point of reference, a point which may provide a terminus for any relevant relation. 'Now', of course, is simultaneous with its own utterance, and there is nothing further with which it has to be co-present. Of course, there is a matter of justification in that it may not be true that a storm is raging as I say 'now', but even if it is 'A storm is not raging now' that is true, the use of 'now' to fix a present point of reference has not been threatened. If judgements about what is present are grounded in this way, we escape the regress which Swinburne finds in the relational view, and the claim that what is past is past in relation to the present does not have to be abandoned in favour of a non-relational account of pastness.

We go along with the advocates of tenselessness in their claim that events are past and future only in relation to something else, and we also join them in giving prominence to the relation of *earlier than*, but in company with past, present, and future, rather than in place of them. However, we part company with the detensers if they reject the passage of time, deny objectivity to A-series propositions, and treat past, present, and future as

all equally real. At an earlier stage of the debate, provision of a tenseless formulation of tensed propositions was thought by its proponents to secure their position, but they came to accept that this translation programme could not be carried through. Instead, it became merely preparatory to a further assault: the relational character of the tenseless formulations meant a lack of objectivity in tensed judgements. If, as Smart maintained, relational character made for an ineradicable dependence on consciousness, this charge could have been sustained, but this is a further step beyond acknowledging such character. In the same way, recognition of 'tensed facts' does not call for a non-relational analysis. It is not uncommon in philosophical disputes to find opposing parties sharing a mistaken assumption. We have that here in the view that the reality of time requires a non-relational account of tense.

On the tenseless view, finally, all times are on a par; on the tensed view they are not, but the present is somehow privileged. It is not clear how we are to understand this contrast. A given present is just one of the multitude of times or occasions that are, were, or will be present. All presents take their turn; none is privileged, but we can fasten on any point of time and take it as the then present. It cannot be just *this* present that is privileged to the exclusion of all its predecessors and successors, for they too will have enjoyed or will enjoy that privileged status. The present happenings—my writing of these words—are soon to go the way of all presents to date and become past. It would seem that, if the present is privileged, there has to be in some sense a single present, something that perpetually enjoys, never loses, its privileged status, something that will see events come and go, but will not itself recede into the past or move into the future. Is an appropriate picture one of an unmoving window before which events pass, coming from the future and going into the past, a window which survives all change, which retains its character as present in perpetuity? The opposing view might invoke a picture of the present as a moving *now* gradually going along the series of events stretching from the past through the present to the future. There is a symmetry between the two pictures. On the one, the present is static, unlike the events which become present, which move into view and then depart. On the other, it is the series that is static, all times being equally real, with the present moving along that series, the 'block universe' model which invites us to consider all events, including any yet to happen, as somehow 'already there' in a static four-dimensional array, the present being a phase in the history of the universe which we have just reached, and which we are

soon to leave behind as we move on to the next frame. The tenseless view has been found wanting, and will not be rehabilitated in later discussions. The privileged status view is right in refusing 'is real' of past and future, and in thinking of an ever-changing present as what is real, but that is not a matter of the present as something which retains its identity over time, just that what is present is always changing: now one thing present, now another. All that may be said to persist is the relation in virtue of which events are present, a relation which is differently realized when different events become present.

4

Observer-Dependence

Whether at the homely level of past, present, and future, or at the more esoteric levels envisaged in relativity theory, relational character is all-pervasive with respect to time. However, such character does not make observer-dependence inescapable, nor lead to mind-dependence. We shall add to our observations on these issues after a preliminary examination of scepticism, paying particular attention to the question of the reality of secondary qualities, such as colour. Secondary qualities are sometimes offered as a model for understanding time's supposed subjectivity, and to help make plausible the idea that causes might follow their effects: in both cases we are said to project onto the world relations which have their source in peculiarities to be found in us. We shall also make use of the example of colour to introduce considerations concerning empirical equivalence and conventionalism which will prove important at later points. First, some remarks on 'real'.

4.1 REALITY AND SCEPTICISM

The term 'real' has been subject to as much abuse as any other in contemporary philosophy, abuse which perhaps reached its nadir with 'modal realism' and its incoherent claim that merely possible worlds are as real as the actual world. Berkeley's idealism invited the objection that it did not allow for the distinction between the real and the chimerical. Berkeley may not have succeeded in meeting that objection, but he did at least realize that the distinction was one that called for preservation rather than obliteration. The term 'real' is nowadays abused, not only because little regard is had for what it actually means—think of J. L. Austin's (1962) teasing out of a whole range of distinctions in which it is involved, now largely ignored—but because its applicability is taken to determine the truth of factual issues when its interpretation rests on nothing more than a stipulation. A good example of this distortion is provided by the frequent insistence that properties are real

only if they are causally efficacious. That this is a stipulation, a proposal, is evident enough: we do not have to assure ourselves that the age or provenance of an antique is causally efficacious before including it among the antique's properties or features. So, say, if you wish, that length, colour, and the rest, are unreal, but don't add: that is how, in fact, it is. It is merely: that is how you would have us speak.

To this we may add the following consideration. However 'unreal' is understood, whether as 'inconsistent', 'illusory', 'not invariant', 'perspectival', 'relative', or 'subjective', it can import nothing more than is licensed by the description on the strength of which it is introduced. So, if we are happy to accept that certain physical magnitudes are not invariant, say, but uneasy about the claim that they are in consequence unreal, we may reassure ourselves with the thought that, if an ascription of 'unreal' is warranted on this basis, it can have no implications which go beyond those carried by 'not invariant'. Of course, such unease may lead us to query the suitability of non-invariance as a basis for the ascription. Likewise with arguments which infer the illusoriness of our conception of the past on the grounds that, say, the distant past is distant only relative to some point in time. Where is the illusion? How would it be if the distant past were distant, but *not* relative to some point in time? Compare the claim that 'just as nothing is in reality *here* or *there*, so nothing is in reality *now* or *then*' (Mellor 1998: 51–2). There has to be a significant departure from our use of these words if they are to stand any chance of being true. The question to ask is: does the proposed interpretation of, say, 'Time is unreal', imply the falsity of beliefs which we should otherwise reckon correct? If so, query the interpretation; if not, a query may still be in place, but we can accept the judgement with equanimity.

The most pressing difficulty with sceptical claims relating to time is one of seeing how we could make sense of them if they were true. This is a particular instance of a general problem which besets, and indeed often puts paid to, scepticism. To explain, conjectures about the reality of some category of event, thing, or property are not, when philosophical, to be taken as empirical hypotheses. If, in everyday life, you wonder whether some diamonds are real, the question posed is one to be answered within experience. You, or someone more expert, put yourself into a position to determine the stones' character by making appropriate observations and tests. If, similarly, you should wonder whether the wallpaper is really pink, and not just a white surface taking up the hue of surrounding red objects, it is again an empirical question that has been raised. If, however, a philosopher—or scientist—denies that physical

objects are ever really coloured, he is not advancing a hypothesis of that variety. He is not about to take us into a setting where objects can be better seen for what they are, and where their lack of colour will become apparent. Because he is not quarrelling with the fact that anyone with unimpaired vision will judge a given object to be red, let us say, there is a difficulty in giving any sense to his denial of colour. That is, however tolerant we may be towards bold and unusual conjectures, we cannot accept even as a hypothesis the suggestion that *nothing* is coloured; we cannot accept this and at the same time insist that we know what it would *be* for something to be red, green, blue, or whatever. If it is not as with red blood, green grass, blue sky, and so forth, then we have simply lost altogether our grip on these notions. Our descriptions in such terms do not rest upon risky findings or vulnerable theories, but 'green' just is the word we have learned to apply to things which strike us visually as does this grass, samples we should enlist in teaching the word's meaning. This is not to say that we may regard ourselves as infallible concerning colours; it is just that we understand going wrong in such a way that our error can be brought home to us within experience, whereas for the sceptic any experience is irrelevant. It is accordingly not in place for him to cite instances of widely held empirical beliefs which have shown themselves to be wrong, as with the belief that the earth is flat. In coming to reject such a view people were not obliged to abandon their concepts, but it came to be appreciated that the earth was not flat in a sense of 'flat' which they had employed, however confusedly, before the discovery. It has to be this way if it can correctly be said that their belief had been overturned.

It is important to emphasize that any force which a denial that things are coloured may enjoy is likely to be felt only so long as we fail to let go of the belief that a *factual* claim is being advanced; the claim has the power to disturb precisely because we unthinkingly align it with empirical claims about how the world is, or is not. If you have got it quite wrong about the colour of the wallpaper, it may come as a shock when your error is brought home to you on viewing the paper in more favourable lighting conditions. No such contretemps is threatened by the sceptic. For us, a denial of colour to a physical object is tantamount to a claim that it is colourless, but being colourless, as with water or glass, is to be in a recognizable condition in which trees, trucks, trousers, and so forth, patently are not. The usual consequence—that we can see through something colourless—is quite clearly not satisfied with such things.

But scepticism surely need not always be misplaced. Have we left room for any of its genuine manifestations, as, for instance, scepticism with respect to belief in ghosts may well be? There is a problem of meaning with respect to the term 'ghost'. If it means something like 'apparition' in a broad sense, it could, while obviously in need of clarification, perhaps make some sort of sense, but if it signifies (in addition) the soul of a dead person, it is difficult to know just what character as a ghost entails. So long as this difficulty persists, we do not have a well-defined issue to address, but in so far as the term can be satisfactorily clarified, it would seem to be an empirical question as to whether there are ghosts, and one who has doubts as to their existence is sceptical in a comprehensible and rational way.

What can the sceptic about secondary qualities be claiming? He is refusing to speak of things as being coloured; that is clear. But since his refusal is not backed with observational findings, actual or projected, it would seem that it has to be the very *concepts* of green, coloured, etc., that are, for him, at fault. If leaves cannot be green it is because it somehow makes no sense to speak of them as such; they are as improper subjects of colour as is a sense of wonder, a glimmer of hope, or a futile gesture. This being so, the sceptic should not say that leaves are not green, since that pronouncement is geared to a reading which it is his concern to reject; it uses the very language that is suspect in his eyes. Yet to make out a case for conceptual incoherence is surely not a real possibility: right and wrong may not be well-defined notions in connection with aesthetic qualities of colour, but as regards bare colour ascriptions, as of red, amber, and green to traffic lights, they assuredly are. Whatever the sceptic's arguments, the utility of our colour concepts will not be compromised. We shall still be concerned to match coloured things in a way we find pleasing, still take delight in dazzling arrays of colours, still use colour as a guide to ripeness of fruit, heat of objects, state of health, and so forth.

In much philosophical writing, too little attention is paid to the question whether a problematic proposition is to be taken as empirical or conceptual—a key consideration when it comes to appreciating the nature of the problem and how it might be resolved. Discussions of temporal matters are no exception. The disputants' attitude to the issues—as of the reality of past or future—is often one appropriate to empirical or factual matters, as though there were something to *discover*, whereas nothing of this nature is or could be cited in support of what is properly considered a conceptual issue. One source of this regrettable failing is to be found in misgivings

concerning the division of propositions into the analytic and the synthetic, a distinction which many think Quine showed to be ill-defined, or more generally unsustainable. Quine's assault on the distinction centred on the conception of an analytic proposition as one which we hold to come what may. An ostensible analytic proposition is thus akin to a prediction, and an unsafe one at that: we cannot be sure that our proposition will not be revised at some future date. My concern is more immediate and transient: how is a certain claim, as currently advanced, to be understood? Never mind that it might be revised at some later date; if its proponents cannot tell us whether or not the only way it might be faulted is conceptual, then it is their position that is ill-defined. They cannot take refuge behind a protest that the distinction between the empirical and the conceptual is unclear, that the standing which a form of words has today may not be the standing it enjoys in the future; if it is unclear how someone is using the words, then it is up to that person to remove the unclarity, to make up their mind how they wish to be understood, if they are to have any hope of putting forward a proposition which is sufficiently determinate to be a candidate for truth or falsity. And it is no advance to cover up the lack of clarification by labelling the proposition 'metaphysical'.

Turning now to scepticism concerning time's reality, there is no question of an empirical refutation of relevant propositions, as 'It took a year to find a buyer', or 'He dropped dead on the stroke of noon', but if they are to be rejected it has to be on grounds of conceptual defectiveness. As with attributions of colour, we must allow that we may be wrong in making such claims, but our being wrong is again something we understand in a certain way, as when matters fail to turn out as the truth of a prediction requires. If it is allowed that the situation is one where 'It took a year to find a buyer' would commonly be considered an appropriate form of words to use, if there is no question of our being shown, in a way we should recognize, that things are other than we take them to be, then it is difficult to know what the sceptic could *mean* in saying that we were wrong. We cannot even concede that truth may be on the side of the sceptic and at the same time continue to hold that we know what is being spoken about when we or others use the words. Indeed, scepticism here is so far-reaching, it is difficult to see what we can claim to understand. All movement, all change, being illusion, we have lost altogether our grip on such descriptions as 'walking', 'chewing', 'throbbing', and so on for practically every verb in the language—not to mention 'real' itself.

Scepticism is particularly puzzling when a denial of the reality of time is coupled with an insistence that our ordinary temporal judgements remain unimpugned. However, there is a related move that is less self-destructive. Philosophers enjoy no special authority when it comes to deciding the truth of such propositions as 'Your fingers have a bluish tinge' or 'She whistled while she worked', and when they do seek to establish or refute them they must respect just the criteria which other mortals do, the criteria appropriate to the interpretation and kinds of evidence which such propositions are recognized to have. This appears to leave philosophers with very little to do in this area, but while there is no question of contradicting a judgement which, by our ordinary lights, is to be reckoned true, a philosopher could conceivably have something useful to say by way of explaining just what the proposition involves. Think again of Berkeley. He was anxious not to contradict the plain man's beliefs about the physical world, but saw his task as one of telling us what they come to when rightly understood (see the first of the *Three Dialogues between Hylas and Philonous*). However, on occasions he departed from this programme, saying such things as that sugar is not really sweet. This is, of course, not so: if anything is sweet, sugar is. But if he had said that for sugar to be sweet was nothing more than for it to have the capacity to produce sensations of sweetness in a sentient being, he would have made his essential point—right or wrong—without being committed to this absurdity. Similarly with temporal judgements. Candidates, not for a general rejection, but for an illuminating, and possibly unexpected, analysis. Indeed, I should like to think that this is what emerged with our analysis of temporal precedence, and when we queried the need to ascribe a referential function to 'now', an ascription which has generally been assumed to be beyond question.

If there are any grounds for challenging our practice with respect to temporal judgements or ascriptions of colour, they would have to rest on finding some incoherence therein, and the only way this would appear remotely possible lies in showing that the consistency needed to confer meaning on the relevant vocabulary is not to be found over the speech community. And indeed there is the idea, not uncommon, though not easy to make plausible, that some fragment of a language may be inconsistent. However, while individuals can be inconsistent in what they say, if it could in some sense be said that the language justified both *P* and not-*P*, we should surely take this as proof that some word or words were to be taken in more than one way.

This is just one of the protective strategies which may come to our rescue when we are faced with inconsistency. A more familiar defence is to exploit the distinction between how things are and how they appear. Our ascription of a single shape or size to a body is sometimes challenged on the grounds that the body will exhibit a number of different appearances in respect of shape and size. However, not only do we have the formula, 'appears *F*, but is really *G*', to invoke, but the multiplicity of appearances confirms constancy in respect of these properties. A square surface can be *expected* to look diamond-shaped when viewed from certain angles. The threat to our belief in an unvarying square shape would arise if there were not this diversity, if the table continued to present a square shape whatever the position from which it was viewed. Likewise with size. An object which continued to take up the same proportion of our visual field when we moved away from it would have either to be following us at a constant distance or expanding in proportion to the distance moved. Similarly, as noted with time. Judgements concerning past, present, and future can be *expected* to vary in accordance with the positions in time of those making them.

These traditional sophisms are now of interest only in so far as they lead on to cases where variability is not so readily expected, as when we are told that objects which we judge to be heavy would be found to be much lighter on the moon, or when a surface that looks uniformly red to the naked eye is found to be a mixture of colours when viewed under a microscope. Consider the latter. When enquiring as to the colour of something, we have in mind the colour as this would be ascertained in certain circumstances—where there is sufficient light to see the coloured object clearly, where there is no interference from light sources which might distort the colour, and so forth. There may be no telling what a coloured object will look like when viewed in novel circumstances, but we are entitled to stand by our description of something as 'red' if that description is sanctioned by the standard perceptual conditions, even though it is not suited to the novel situation. That is how we understand 'the colour of an object'—that is, a matter of the colour as ascertainable in certain standard conditions. On the other hand, we have equally to allow that this may not be a fitting description in other circumstances.

There is to some degree an analogy here with time. There are certain novel circumstances—when we are moving at speed relative to another reference frame—in which our calculations of time elapsed and our judgements of temporal ordering will not accord with calculations and judgements made within another's frame of reference. A factor of relevance to our temporal

judgements and which, being normally constant, is not appreciated as having a bearing upon them, is revealed to be crucial when the circumstances are varied, and this in such a way that we cannot hold to conclusions reached which fail to take this factor into account. Here there is something useful to say by way of elaboration of familiar ways of speaking.

Back to the usage of colour terms. Divergent colour judgements may arise when someone is unable to make recognized colour distinctions, but the scheme into which such divergences fit is clearly one where colours are treated as features of things to be detected in favourable circumstances by those who have the requisite faculties. A suit may have a fine pinstripe which cannot be detected in the artificial lighting of the shop, or may even be missed by some when the cloth is viewed in the sunlight. The lighting conditions are conditions which make it more or less easy to see what is there, and those would-be judges who fail are found wanting when set against those who possess the requisite discriminatory powers. The scheme is very much objective in the way the publicly perceptible object is in focus as something against which an individual's perceptual competence may be tested. It is a scheme, moreover, which leaves it open that other creatures may do better than us. An inconsistency is not revealed when it is found that dogs can hear sounds which we cannot; there is something there to be heard which is beyond the range of our hearing, that is all. Here we might cite even more out-of-the way perceptual powers, as with the 'electric' sense which some fish possess. There is no question of having to *correct* for the 'peculiarity' of the more discerning creature, as Bernard Williams would have it (1978: 241); how would correctness be determined?

Note that this scheme can survive the possibility of irresolvable perceptual disagreements, as when the number of people who judge a colour to be pure blue is matched by the number who deem the blue to have a greenish tinge. This does not throw the scheme into confusion. At the level of 'blue', how the colour really is is broadly defined, but not at a finer level, though it is not then that 'the true colour' has a clear sense, only we do not know when it applies. And while we can say no more than that the blue is pure to some, faintly greenish to others, it is still required that there be cases where something is generally deemed blue, or greenish blue, if we are to make meaningful use of these terms. (See Wittgenstein 1958: 226 and Hacker 1987 for this and other relevant arguments.) Compare attempts to show the impossibility of a non-arbitrary use of 'true colour' by noting how patches of the same colour may look quite different if their backgrounds are different. So we can know

that they are patches of *the same colour*. As just intimated, this is not to say that 'true colour' or 'real colour' can be assured of application—as Austin pointed out (1962: VII).

There is not an inevitable tension between *relational* and *real*, but it is worth giving some attention to the term 'looks', which is likely to figure in the characterization of relevant relations pertaining to colour. Its use is sometimes taken to imply that we have to do merely with appearances, not reality; after all, we can consistently say that things look coloured, but are not really so. However, analyses in which 'looks' plays a central part are to be viewed rather differently once that implication is seen for what it is.

To appreciate why talk of 'mere appearances' is not to be defended just on the strength of the applicability of 'looks', it is important to see why 'it looks *F*' often has a tentative character, leaving the way open for 'but it isn't really'. This feature is a reflection of the *restricted* scope of such a judgement. In saying that something looks damp, say, we are indicating that our judgement is based only on what is disclosed to sight in the given circumstances, and since what is learned or surmised in this way may not suffice for a final verdict, we leave room for a contradictory judgement. If this diagnosis is correct, then we should expect any suggestion of uncertainty to be absent so long as there is no call to supplement the findings of sight by those of other senses, or by what might be disclosed to sight on other occasions. And this is indeed what we find with, for instance, such an observation as 'A television set looks incongruous in a cathedral'. Conceivably we may wish to leave room for 'but it isn't really', but it is at least as likely that 'looks' is chosen simply because the object offends *visually* in those surroundings. Again, consider 'The room looks better with the new wallpaper', where there is again little scope for the addition, 'but it isn't really', and there may be little to choose between propositions about how the sky looks at sunset and how it then is.

It is not just 'looks' that behaves in this way, but verbs relating to the other senses, as 'feels', 'sounds', tastes', and 'smells' show a similar logic. The object sounds hollow when you tap it, but the auditory marks of hollowness are not decisive; we have, once more, only partial evidence. Similarly, if something smells rotten, it need not be so, whereas if it is said to smell disgusting then it may be *just* the smell that is being characterized, in which case the possibility of adding 'but it isn't really' depends on finding something other than the smell for 'it' to refer to. Again, 'It tastes bitter' is generally decisive as to bitterness in a way that 'It looks genuine' is not with respect to authenticity.

If, now, it is said that being yellow is a matter of looking yellow, the point of 'looks' should be to direct us to the visual, rather than to allow room for error or relativity. If it is said that yellow things merely *look* yellow, this can hardly imply: but they're not really. The generality of the claim leaves us with no possibility of specifying any circumstances in which this denial could be substantiated. What we have is simply the platitude that yellow things are only *seen* as yellow; that is, in speaking of how things look, we are speaking of how things are to sight. If it is true that buttercups look yellow only to *us*, to human beings, that is because for some reason we alone are capable of perceiving that colour. That is, we have at best an empirical, not a grammatical, truth. The only relevant 'relativity' having a claim to the latter status is: yellow things are yellow only to *sight*.

If terms such as 'look, 'taste', 'feel', 'sound', and 'smell' merely focus on the sensory modality in question, with no essential contrast with 'really are', we are not inverting our priorities in proceeding via an appeal to these terms in offering the relevant explanations of what it is to be yellow, bitter, and so forth. Being bitter just is tasting bitter. It is not like supposing that one could first understand 'probably *P*' and only subsequently come to an understanding of the unqualified *P*. However, while there need be nothing amiss in giving an account of being coloured in terms of how things look, to do so in terms of how things *seem* or *appear* does attract just such an objection, in so far as this way of speaking presupposes a grasp of locutions specifying how things *are* in the relevant respect. If someone says 'This appears to be red', we can ask 'Appears to be *what*?', and to answer that query a suitable sample will have to be exhibited. Compare Wittgenstein in *Zettel* §§417–20 (the translation unfortunately renders *Das scheint rot* as 'That looks red'—in general an accurate rendering, but not when the distinction between the present contrasts is critical). Propositions about colour could be regarded as dispositional, in the sense that they are about how things will or would look, but the disposition is not a causal one; not about what the effect coloured objects will or would have on you, but about what you will or would *find*, where what you may find is dependent on what is there to be found. Finally, the correctness of '*is* red' is not threatened by the propriety of using the implicitly relational '*looks* red' in the same circumstances. What is of interest is to specify the conditions in which 'looks red' can be replaced by the unqualified 'is red'.

Our judgements of colour can be said to be relative or relational in so far as they are judgements about how things look in certain circumstances and

to certain observers. We have noted three forms which relational character may take: a surface that looks uniformly red to the naked eye may present a mixture of colours when viewed under a microscope; what looks to be pure blue to some may be judged to have a greenish tinge by others, and perceived colour may depend on other properties, such as shape and boundary. What is important is not to conflate key terms to which we may have recourse in our reflexions on these phenomena. In particular, we should not pass from *relational* or *relative* to *observer-dependent*, and thence to *subjective* or *mind-dependent*. It is right to draw a parallel between secondary qualities and temporal predicates, but that is not to connive in these misconceived transitions. Thus, what is past is past in relation to what is deemed present, but the latter need not involve an observer, and even when a conscious being provides a point of reference, the relation does not become one of mind-dependence. We shall now take further our discussion of the latter relation.

4.2 MIND-DEPENDENCE, INDETERMINACY, AND CONVENTION

There is clearly no contest when it comes to allegations that we are forever mistaken in our judgements of sensory qualities, but it may still be thought desirable to ascend to a level where our characterizations are of things as they are in themselves, characterizations which may be considered 'absolute' in the sense that they are independent of the situation of human beings 'located on the surface of a certain planet at a particular stage of its history, being of a certain size and having a particular range of sensory faculties' (Dummett 1979: 389). Likewise, Bernard Williams draws a distinction between the world as it really is and the world as it seems to any observer in virtue of that observer's peculiarities, and he considers that there is every reason to think that the former conception, the conception of the world as it is independently of all observers, should leave out secondary qualities (1978: 241).

The phrase 'things as they are in themselves' has unfortunate connotations, having figured in numerous arguments aimed at showing that, given that our knowledge is under a necessity to conform to certain conditions, we cannot know things as they are in themselves. Since the premises specifying the requisite conditions are often trivial truths—for instance, we can know only what our faculties permit us to know—it is a mystery how any conclusion

of substance can be thought to follow (cf. Stove 1991: ch. 6). Compare the contention that fatalism can be derived from nothing more than the truth that whatever will be will be, at the same time being regarded as a substantive, indeed a threatening, belief.

The shift from 'what we can know is dependent on what sense faculties we possess' to 'the features of which we have knowledge are mind-dependent' is one of the besetting sins of idealism. Here is one contemporary example of the way the platitudinous premise is offered as a ground for a metaphysical conclusion:

> All the ways we have of perceiving objects—sight, sound, touch, taste, smell—are such as cannot exist independently of sensory and nervous systems; and all the ways we have of thinking about objects are precisely that, namely ways of thinking, and can no more take place without brains than seeing can take place without eyes. If we abstract from our notion of an object all those aspects of it that are sense-dependent and mind-dependent we are left with, at the very most, the notion of a something, an *x*, to which we cannot assign any observable or conceptualizable characteristics. This notion of an object is metaphysical in the sense that, by definition, no such object could ever figure in experience.
>
> (Magee 1998: 178)

For you to see the cat, it must not be in total darkness or hidden under the bed, but other things must be true of you as well—you must have your eyes open and be looking in the right direction, and of course have eyesight that is up to the task. How could the fact that such conditions, physical and psychological, have to be fulfilled on your side have the consequence that what you purportedly see is sense-dependent and mind-dependent, that, indeed, what you see is not a cat?

Dummett's argument takes an intriguing turn. He suggests that it is an illusion to think that we know what it is for material things to exist independently of there being any observers in the universe, since the content of a description of physical reality in experiential terms is given by its consequences for possible observation of it. It is only by surreptitiously imagining ourselves as observing the world that we suppose ourselves to have a grasp of what it would be for a universe devoid of sentient life to exist (1994: 359). Moreover, while, by making use of abstract mathematical models, physics 'has made enormous strides towards attaining a description of physical reality in terms every less dependent for their meaning on our experience of it' (1994: 358), we do not know what it would be for these models to exist as real, since they have in themselves only structure, no

content. Conclusion? 'We *cannot* attain a form of description that at the same time is wholly independent of our experience and can be understood as describing a physical reality whose existence is intelligible in itself. This is not to say that the absolute notion of how things are in themselves is incoherent: merely that it can be given sense only by equating it with how they are known to God' (1994: 359). Perhaps, but that we can lay claim to an understanding of 'how things are known to God' which we might draw upon to clarify 'how things are in themselves' is not beyond question.

Some of the points in Dummett's argument will be looked at further in Chapter 9. For the moment we shall dwell on one of the principal errors in the idealist's reasoning. It would be quite wrong to claim that what we *perceive* depends on us—on our senses, our size and situation. What we are *capable* of perceiving depends on us, but the existence and nature of what we perceive does not. This latter 'what', it should be noted, is a relative pronoun—the 'what' which renders 'He knows what he doesn't know' contradictory; the preceding 'what' an interrogative—the 'what' which allows this proposition to express a possibility: he knows what it is he doesn't know. The answer to the question of what we are capable of perceiving depends on facts about us, but the existence and nature of what we perceive—that is, of the things we perceive—does not so depend, yet it is dependence of this latter kind that relativism (and idealism) need. Here it is important not to lose sight of the point made above about objectivity. By using our eyes, ears, and other senses we succeed or fail in making out the character of diverse phenomena, and other creatures are more or less well equipped than us with respect to these tasks. A query is raised about our perception of colour when we fail to discriminate the patterns in the array of colours on the test card, not when we *succeed* in making out the full range of colours. The consideration that we could not become apprised of certain properties if we lacked the relevant senses does not show those properties to be in any way subjective, nor does variability in powers of detection mean subjectivity of what is detected. The senses of animals and men can be compared in terms of how much they put them and us in a position to detect, but a necessary means for becoming apprised of some sense modality, as hearing is for sound, is not something that can be dispensed with when our concern is with how things are in an absolute sense, where this means: not being dependent on us, or on other sentient creatures, for being as they are. Any attempt to show that sense qualities are subjective is more than likely to come ominously close to the idealist's unacceptable argument, extracting a substantive conclusion about

the supposedly observer-dependent character of what is known from trivial truths about the scope or range of the subject's perceptual powers.

But we are still not quite done with mind-dependence, and in particular with complications which arise with the possibly relational character of colour ascriptions. In general, claims for observer-dependence fall foul of the considerations just advanced. Colours may strike us differently depending on such conditions as the intensity of the light they reflect and the angle at which the coloured surfaces are viewed, but these are conditions which hold for observers quite generally. They have none of the subjectivity of hallucinatory experiences, for instance. However, there are more complex cases. An object looks pure blue to one person, greenish blue to another (see Tye 2006). Which is it? It cannot be both, but it appears arbitrary to opt for one rather than the other. As indicated, there may be cases where true colour is simply not defined, but this example is problematic. To see why, consider Austin's example of a species of fish which looks vividly multicoloured, slightly glowing perhaps, at a depth of a thousand feet, but looks a muddy sort of greyish white when viewed out of the water (1962: 66). Greyish white might be taken to be its real colour, but, says Austin, we do not have to say so. This example is not troubling, given that the fish is of a different colour at different times and in different circumstances. However, our problematic object is held to be different at the same time and in the same circumstances. We say that the judgements '*x* is pure blue' and '*x* is greenish blue' cannot both be right, and it is arbitrary to opt for either. However, they can both be wrong, and in the absence of any other candidates for true colour, we may feel obliged to say that the object has *no* colour. The colour of an object is not an objective property of that object, but something we project onto it, different observers possibly making different projections.

In passing, there is some reason for opting for the real colour of the fish as the colour seen under water. We can distinguish between objects which reflect light, and light sources. An object of the former kind is best viewed in sunlight if we are to tell what colour it is, sunlight, as white light, not accentuating or obliterating particular colours. A light source, on the other hand, might not be appreciated for what it is, in colour terms, if it has to compete with sunlight, or some other form of illumination, but is best viewed in the dark, without any such interference. As with the fish, so, too, we can better see the green glow of the luminous markings on a watch dial if we view them in the dark.

To return to pure blue and greenish blue, if observer-dependence is just a matter of looking different to different observers, we do not have subjectivism in any contentious sense. This is where our account of 'looks' comes into play. In saying that an object looks blue, there need be no implication that it is not really blue. True, 'looks' remains less demanding than 'is', agreement being required as to how something looks over a range of conditions before we can pass to 'is', but we could have a use for 'looks blue' without having settled on circumstances in which a transition from 'looks blue' to 'is blue' is licensed. There will be cases where this transition can be made, and cases where it cannot, but when it cannot, that will not be because the colour has then become a mental or subjective phenomenon. I claim that *is* blue is a particular instance or refinement of *looks* blue, there being a tension between the two only if *looks* blue is taken as *merely looks* blue. Likewise with other sense modalities: being bitter is generally tasting bitter, though we could perhaps have contexts in which something was said not to be really bitter, but merely to taste bitter.

It appears that an issue of greater moment is given with the problem of comparing one person's colour perception with that of another, as required by the question: how do we know that what you see as red I do not see as violet? It is tempting to take a short way with this query. The question of how you see a coloured expanse is to be answered by noting the descriptions you give along with your performance in comparing and contrasting things of this and other colours. It takes no more than agreement by two people in these respects to show that they see things in just the same way. That, indeed, is just what identical colour perception *means*. However, the example of the inverted spectrum appears to show that this dismissal of the problem is too swift. Suppose that the light which enters your eyes is transformed in such a way as to invert the spectrum of colours within your experience, the violet end of the spectrum, as observed by others, being mapped onto the red end, and vice versa, as perceived by you, and all the intermediate hues being re-ordered. Verbal and discriminatory behaviour would give no clue as to this inversion, but it would surely mean that your colour experiences would differ from other people's.

As it happens, there are asymmetries which would lead to discrepancies in the judgements of normal individuals and those experiencing inversion, but suppose that this was not so. Could we then insist that such inversion may none the less be experienced by some? That we have a real possibility seems evidenced by the apparent coherence of the supposition that there might be a

device external to us through which we could view things having their colours transposed in the way contemplated. If that is so, then a difference in colour perception from person to person could at least be established indirectly by ascertaining physiological conditions which duplicated the workings of the device. But suppose that this is not accepted as entitling us to speak of inversion, the objector complaining that only if we could somehow look into the mind of another person, to the extent of sharing his perceptual experiences, could we be made aware of sameness or difference: we might find conformity with our own experiences, or we might find differences consistent with a reversal of the spectrum. However, while this is a natural response, such access is surely ruled out logically. There is no such thing as becoming the other person in the way required to be party to his experiences, so the help which this criterion appears to offer is illusory. But one person could be given the other's eyes—or, less ghoulishly, exact copies—and that would offer a possible resolution. But again, this may not be considered to decide the matter. Very well, but if that is so, and if the usual tests of colour discrimination are not definitive, how are we to understand the proposition that two people have the same, or different, perceptual experiences?

It may be possible to present a decisive case in favour of one or other party, but my concern is not to follow this problem towards a final solution. What is of primary interest is the question of the position we should find ourselves in if sameness and difference can be neither proved nor disproved. So, perhaps we favour a presumption of sameness if this appears to be established by the usual considerations, but we do not rule out the possibility that undetectable cases of inversion occur. If there are no empirical findings which would show definitively that two people agree in their experience of colour, then we may maintain that they do, or maintain that they do not, without fear of refutation. It is then not a matter of a state of affairs of which we could have knowledge but, unfortunately, do not, knowledge which would show where the truth lies, but whether we speak of sameness or of difference, we can be giving expression to no more than a *decision*. The protection from refutation leaves space for alternative modes of description, leaves us free to go in either direction, with no consequences for future findings attending the one rather than the other. But if it has proved that sameness and difference simply are not defined in this context, will not the problem of meaning which they present simply carry over to the use of the words in formulating our decision? No. That decision is to be seen as the determination of a concept, not as a report of an empirical finding. And, of course, we do not have to take a

decision either way, but may simply refrain from using 'looks the same' in certain circumstances.

The same issue may present itself with respect to other species of creature. Do the birds and the bees see things as we do, in terms of colour? There is no question of a comparison with respect to how we and they *judge* things to be, but we may make patterns of response crucial: they are or are not consistently capable of picking things out in accordance with categories which match our colour divisions. The physiology of their eyes may also lead us to favour a certain answer, different no doubt for different creatures. However, we may not find these varying considerations decisive, but conclude that the phrase, 'how things look to . . . ', does not have a clear sense when non-human beings are in question, so leaving us free to use it in accordance with different criteria without risk of falsification. It is not that knowledge about the way things look may in these cases be unattainable because we are dealing with a metaphysical issue. The whole force of the argument is that determining how things look to other creatures is closer to a decision than a discovery, and it is not until the decision has been taken that there is anything to know, or fail to know.

The style of argument invoked here is deserving of attention with respect to a number of philosophical issues, the question whether fish, say, feel pain being one, the 'brain in a vat' puzzle another. Here is a further illustration. Imagine that an object vanishes without trace, and that another indistinguishable object eventually appears, seemingly from nowhere, in the same or in a different place. Could the two be reckoned the same object? When the identity is straightforward, the original object can be tracked through space and time from its initial to its final position, but in this instance we are supposing that no such path can be found. Again, two possible responses. On the one hand, we may be impressed by the particularity of the indistinguishable objects, which may be supposed to agree in every last detail and not, as far we know, to be replicated elsewhere. On the other hand, the two do not enjoy the kind of history that ensures their identity, and which may be thought necessary for it. Indeed, in the absence of an appropriate space-time path which would clinch the matter, we leave room for the possibility that a further duplicate should be found with as much right to be identified with the original as the first duplicate, a finding which would put paid to any identity: the two replicas being distinct, there is no question of their both being the same object as the one which vanished. We might take this consideration to decide the issue in favour of a difference, but

suppose that the vanishing of objects followed by their apparent reappearance becomes a familiar phenomenon, with a replica appearing in the same place as the original only minutes after the latter has disappeared. It would seem that we might then opt for sameness—replicas at other locations not being deemed the same as the original—or we might opt for difference. This would be a matter of a different *decision*. In neither case is there any question of a possible empirical refutation or confirmation, so it would appear that a decision is all that can resolve the issue.

Moving objects provide similar examples. So, imagine that when a marble is rolled across a table it seemingly goes out of existence intermittently, but always reappears at the point where it would have been if its existence had been continuous. The case for speaking here of a single marble might well be found compelling. Whether we are dealing with stationary or moving objects, what, once more, would not be a resolution is to claim that, in the absence of an observable space-time path, we can postulate a metaphysical route between objects deemed the same. This might appear to give us a rarefied, undetectable, version of a familiar path, but given that it has not been explained what such a path would be, it is hard to distinguish 'rarefied' and 'undetectable' from 'imaginary' or 'illusory', and we remain left with a decision as the only rationale for affirming sameness.

This way of arguing is important not only for the present issue. It, or some variant of it, is invoked by Einstein in his account of simultaneity, and we shall have occasion to exploit it when dealing with the possibility of time without change. It is not a matter of the positivist's response: the circumstances envisaged are such that the putative state of affairs cannot be known of, so it is meaningless to affirm or deny it; rather, because the state of affairs cannot be known of—indeed, there is in the circumstances, nothing *to* know—we are at liberty to offer either description.

Such a conventionalist response tends to be confined to the context of physical theory, as with the example of simultaneity. Again, the choice between Euclidean geometry coupled with the supposition that light is propagated in a straight line, as against the coupling of non-Euclidean geometry with the supposition that light rays follow a curved trajectory, provides another example (cf. Poincaré 1952: 73). The conventionalist often meets with opposition from the realist, who wants the matter of *truth* to be decisive in choosing between theories, but if there is no prospect of adjudicating between them on the basis of a difference in the predictions which each implies, how can one be true when the other is not? If, despite their

empirical equivalence, a difference in truth keeps them apart, then it must be a metaphysical rather than a physical difference, yet the subject matter of the relevant theories appears to be exclusively physical, the distinction between the two being a distinction without a difference until a decision is taken to adopt one rather than the other. But how can a proposition have its truth decided by a decision or a convention? That query is very much to the point if the meaning of the relevant propositions is sufficiently determinate as to provide us with something that can be established or refuted, but if that is not so, we are not usurping truth's rightful place, but acknowledging that the question of truth is premature. Far better to resolve the matter of meaning by a decision to extend the use of a problematic form of words to cover certain knowable circumstances, than to seek to plug the gap in what can be established by appealing to an as yet unexplained metaphysical possibility.

4.3 TEMPORAL PARTS AND TEMPORARY INTRINSICS

Continuing with our reflections on scepticism, we turn now to a conception of time which, if sustainable, would undermine the very notion of change. Time may be thought of as a dimension in which certain kinds of change can be accommodated, but there is another way of reconciling contradictory attributes: instead of saying that the poker is hot and cool at different times, we could think of the poker as a succession of temporal 'parts', one of which includes being hot, the other cool. So, not the same thing bearing different attributes at different times, but different things being bearers of the contradictory attributes. Which approach is to be preferred? The familiar conception has the advantages which fall to a well-established way of speaking: we know our way around the conceptual scheme in which the relevant vocabulary is embedded, the familiar linguistic moves made, even if we are occasionally hard-pressed to give articulate answers concerning the character of this scheme. The temporal parts view, by contrast, has not stood the test of practice, cannot rely on ready agreement in speakers' reactions and intuitions, and is based on definitions which could conceivably result in tensions with other concepts.

Or, rather, this is so if in speaking of a temporal part of an object we are doing more than speaking of the object as it was at a particular time. Certainly, as usually explained, the temporal part terminology presupposes, rather than dispenses with, a grasp of the familiar conception, as when we

are introduced to the concept of a temporal part of a *chair*, say, and other terms are going to have to be redefined in this novel application, 'part' being an obvious instance. Thus, one object can have another as a part only if the latter object exists, but while this holds for physical objects, something can be a temporal part of an 'object' even though it no longer exists. But if that is found unacceptable, discard the offending term; nothing need hang on the choice of 'part', but we could revert to 'stage' or 'phase'. At all events, it may be that the temporal part terminology offers a viable alternative, in which case it is not a matter of which scheme is correct, but which—if any—wins out on other grounds, such as suitability to some purpose. This has been claimed for temporal parts with respect to the formulation of relativity theory, but there is no question of weighing up alternative *theories*, if to say this is to imply that the one scheme might have consequences which exclude the other. Rather, we have to do with alternative 'grammars', or systems of concepts, much as we might find on investigating another language. Indeed, those who claim exclusive acceptability of the one scheme over the other might be compared with those French grammarians who considered French alone to be an acceptable tongue—the only one to follow the actual course which our thoughts take. Or again, if we find one scheme counter-intuitive, this can be only in the way we find some feature of a foreign language—its word order, say—counter-intuitive, when set beside our own. This of course assumes that the two schemes are expressively equivalent, an assumption which cannot be taken for granted with temporal parts terminology.

It is important that the issue be viewed in this way, since there is a common tendency to regard the adoption of the one or other set of temporal concepts as the adoption of a particular metaphysical stance, with the implication that a disagreement as to the facts must underlie the different stances. Even to speak of doubt, belief, knowledge, and so forth, with respect to the different positions is symptomatic of a confusion—as if someone who styled himself a four-dimensionalist, say, possessed knowledge of certain metaphysical facts of which others were ignorant. If the advocates of temporal parts wish to contest the usual way of speaking, the right form of attack is not to look for factual confirmation of their own view or factual refutation of their opponents', but to argue against the latter by alleging incoherencies at the heart of their position. This is an appropriate approach, even if those who adopt it fail lamentably to make out their negative case. Thus, on the temporal parts view it is false to say that a body can be wholly present at any one time, but, while

it looks as though a commonly held belief is being contradicted, the different conceptions of identity that go with the two schemes mean that there is no more than the appearance of a conflict.

Consider further the four-dimensionalist's picture of the world, often associated with the temporal parts conception. Now, in the winter, the trees in the garden are bare, whereas in autumn their leaves had been golden, and in the spring they will be green. If the present is in no way privileged, if, despite their temporal separation, the seasons are all on a par as far as their reality is concerned, an appropriate representation of the world over time will be one in which its occupants are treated as we treat objects in space: whether near or far, the physical objects that exist at present are all equally real. To preserve this character when temporal location is taken into account, we may think of such location as akin to a further spatial determination. It then becomes appropriate to speak, not of three dimensions of space and one of time, but of four space-like dimensions.

Four-dimensionalism, or the conception of the 'block universe', is acceptable in so far as it simply licenses a picture of things spread out in space and time, but it is often coupled with erroneous claims—notably, past, present, and future are equally real, what we call objects or bodies are really events, there is no passage of time and, apart, perhaps, from the changes which human consciousness undergoes, change is unreal. The picture has to be detached from such falsehoods; indeed, if no more is being said than that all events are locatable at their respective dates using verbal phrases which are non-committal as to past, present, and future, it takes very little to see that what is being advanced is unexceptionable. True, without the misconceived accretions the conception may have little point or appeal, but if you do not choose to make use of this picture, that does not have to be because you consider there to be something which it misrepresents.

Am I perhaps being too generous? Does not the four-dimensionalist representation *derive* from the claim that past, present, and future are equally real, rather than being a view to which this is added? Whether origin or accretion, there is certainly good reason for regarding the claim for equal reality as the most important feature of the position in its contentious form. On our ordinary conception, events can differ in respect of reality in virtue of their different temporal locations; remove this as a possible point of difference and you in effect add a further space-like dimension in which these differences must now be accommodated. Differences on a temporal scale remain differences in location, but the only change we are left with is spatial,

as with a pool which is deep at one end, shallow at the other. Or, if change *over* time make sense, it is not a sense with which we are familiar.

Of course, if an alternative way of speaking finds no place for what we can at present say, this is at least a prima facie deficiency. Thus, David Cockburn has argued that the significance of tensed facts is not confined to their role in making our judgements true and false, as the tenseless view would have it. That view cannot accommodate the idea that '*what* an event of a certain kind gives us reason to do or feel depends crucially on whether the event lies in the past, present or future: a past pain, death or shameful deed has, we take it, a quite different bearing on our current thinking from that of a future one' (1998: 88–9).

In passing, an even more radical view of the difference is to be found in Wittgenstein's suggestion that a shift in the very meaning of 'pain' comes with the transition from talking of one's present pains to talking of past pains, since while the feeling is the same in either case, a different *technique* remains to distinguish the primitive (present) expression and the use of 'pain' in the past report (1980: §899; cf. 1982: §479). It seems questionable to describe this as a matter of a difference in meaning of the two occurrences of 'pain', but there are undoubted asymmetries between uses of the past, present, and future tenses which are obliterated by translation into tenseless forms.

Interestingly enough, some have thought to find an advantage in what we might take to be an expressive defect in the tenseless view, as when Einstein sought to sever one of the most firmly entrenched relations of the kind Cockburn cites, that of grief for one who has just died. In its stead he offered the comfort supposedly afforded by a continuing tenseless existence, saying on the death of one of his closest friends, Michele Besso: 'And now he has preceded me briefly in bidding farewell to this strange world. This signifies nothing. For us believing physicists, the distinction between past, present and future is only an illusion, even if a stubborn one' (quoted in Hoffmann 1972: 257–8). But, of course, the distinction between being alive and being dead at a given time stubbornly persists, and with it an occasion for grief and distress. The offer of comfort on the grounds of the supposed illusoriness of the distinction between past, present, and future affords no more consolation than the Christian Scientist's view that pain is an illusion. For those who cannot face the thought of being dead, a more comforting sentiment was expressed by Mark Twain when he said 'I was dead for millions of years before I was born and it never inconvenienced me a bit'.

The misconceived metaphysical approach often associated with four-dimensionalism is familiar when talk of possible worlds is at issue, and when it is insisted against dissenters that there are such worlds. So long as it is appreciated what such talk involves, there should be no argument, familiar idioms concerning possibility simply being recast in a different fashion, but retaining the commitments of the original ways of speaking: to say that there is a possible world in which everything is colourless need mean no more than that it is possible that there should be a world in which this is so. We have nothing to fear in the phrase '*there is* a possible world'; it does not support the elaboration that a possible world is a real world, does not imply that the actual world differs from merely possible worlds simply in being the one we inhabit. David Lewis, the major proponent of modal realism, did not *discover* that possible worlds are real; he decided to extend the description 'real' to them. But it is an extension which would make for the loss of the central distinction between the real and the merely possible, so not an extension which recommends itself. Lewis allows that 'modal realism *does* disagree, to an extreme extent, with firm common sense opinion about what there is' (1986: 133), but to affirm the reality of the merely possible is to contradict a truism; it is not to voice a dissenting *opinion*. True, Lewis does at least try to ground his conception of possible worlds on the consideration that things might be otherwise than they are, possible worlds being for him simply ways things could have been (1973: 84). Again, nothing to fear in 'There are ways things could have been', which simply generalizes on such forms as 'Things might all have been colourless' or 'The world might have been uninhabited'. If it is *this* world that might have been different, we are, of course, dealing with a real world. Not so if the world itself is no more than a possibility. There are ways of being that are realized, and ways of being that are not. Real worlds belong with the former, merely possible worlds only with the latter—where they are joined by impossible worlds: as possible worlds are ways things could have been, so, and equally undemandingly, impossible worlds are ways things could not have been.

We may not consider that our understanding of possibility is advanced by the proposal that 'It is possible that *P*' is true if and only if *P* is true in a possible world, but to withhold 'real' of merely possible worlds is not to refuse this equivalence. However, any realistic application of the formula will be from the possible truth of *P* to defining a world in which *P*'s truth is realized. The thought that the movement may equally go in the other direction may rest on a distorted picture of a possible world. We may investigate our world

to find out whether *P* is true, but whether *P* is true in a merely possible world is not to be decided in this way. We do not somehow come across or discover the state of affairs which *P*'s truth requires, but to allow that there is a suitable possible world requires us to establish the possible truth of *P* in accordance with the normal considerations whereby possibility is determined. Compare differing views as to the reality of the future, where the disputants may adopt an attitude towards the issue appropriate to an empirical issue—as if one might *discover* that the future had somehow been there all along.

As just intimated, four-dimensionalism is far from being metaphysical or in any other way mysterious if it merely makes use of verbal forms which are non-committal as to past, present, and future. Does this amount to invoking a timeless use of 'exists' or 'is real'? If such a use is explained disjunctively, as 'either exists (now), existed, or will exist', we will, as remarked above, have reintroduced the tensed forms which we began by saying had no place in our scheme. The same holds with respect to 'is real', but here a genuine timeless use is more readily granted. Those who wish to dispense with the tensed forms think of past and future occupants of the universe as being as real as those deemed present, the latter no longer enjoying the privileged standing which our tensed form accords them. And it is true that there is a use of 'is real' which is not simply shorthand for a disjunction of the unwanted forms. Thus, elves, devils, perpetual motion machines—anything that is merely a figment of the imagination or has its home in myth, fiction, or legend—can be said to be unreal. Not 'was real but is no longer' nor 'is not real but will be', but 'is not real' *tout court*. So, past or future mountains which figure in our four-dimensional array will be confined to *real* mountains.

However, it may well be that this irenic proposal is not acceptable to four-dimensionalists. It is not so much that they seek acknowledgement that past and future are real in something like the sense I suggest; it is more, or equally, that the distinctions of tense to be found in 'was *F*' and 'will be *F*' are *un*real. Thus Russell:

> It is customary to speak of past and future as ideal in comparison with the actuality of the present; but we must admit the reality of past and future: the opposite course is unduly subjective, for the determination as past or future merely expresses a relation between the time of judgement and the time of the object, which is as irrelevant to the real as whether or when some one knows it. (This is a most lucid observation, by which a host of confusions are routed.)
>
> (Russell 1973: 32)

A relation between the time of judgement and the 'object' may be irrelevant to the real in the sense allowed above, but it is crucial to whether we are speaking of what was or what will be real.

The misconceptions commonly coupled with four-dimensionalism are often also associated with various sophisms aimed at discrediting our everyday conception of three-dimensional spatio-temporal continuants, as with the argument introduced by David Lewis under the title of 'the problem of temporary intrinsics'. Lewis writes:

> The principal and decisive objection against endurance, as an account of the persistence of ordinary things such as people or puddles, is the problem of temporary intrinsics. 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 temporary intrinsic properties; I have them only some of the time. How is such change possible? I know of only three solutions.
>
> (Lewis 1986: 203–4)

The only one of the solutions which Lewis accepts holds that the different shapes belong to different things, different temporal parts, but he first informs us: 'It is *not* a solution just to say how very commonplace and indubitable it is that we have different shapes at different times. To say that is only to insist—rightly—that it must be possible somehow.' Perhaps this is too close to the formulation of the 'problem' to be of much use, but it points us in the right direction; it does not amount to saying merely that change must be possible *somehow*, but to say that we have different shapes at different *times* gives a more specific indication of how the differences may be reconciled, a matter of one and the same thing being differently shaped at different times. Is the worry perhaps: how can something be the same thing if it has different properties at different times? But being the same thing—the same cow, tree, or whatever—is not the same as being the same. The criteria for the former can tolerate failure within the latter. It is difficult to discern a problem, but there is some value in considering further whether the obvious approach can withstand Lewis's objections, especially since the principal rationale for speaking of temporal parts appears to rest on its supposed need in coping with the problem of temporary intrinsics.

The term 'intrinsic' may suggest 'essential', but it amounts in Lewis's use to 'non-relational': 'We distinguish *intrinsic* properties, which things have in virtue of the way they themselves are, from *extrinsic* properties, which they have in virtue of their relations or lack of relations to other things'

(1986: 61). So intrinsic properties would be such as given with 'thoughtful', 'sober', and 'excited', whereas extrinsic properties would be exemplified by 'remote', 'antiquated', and 'ostracized', or, as involving a lack of a relation to other things, by 'uncorroborated' and 'ignored'. The two categories remain somewhat indeterminate—where do we put 'cruel', 'snobbish', 'irritable', and 'helpful'?—but adjectives for shapes, as 'straight' and 'bent', are clearly intrinsic.

It is here that Lewis sees a problem for the commonsense solution:

> First solution: contrary to what we might think, shapes are not genuine intrinsic 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. In itself, considered apart from its relations to other things, it has no shape at all. And likewise for all other seeming temporary intrinsics; all of them must be reinterpreted as relations that something with an absolutely unchanging intrinsic nature bears to different times. The solution to the problem of temporary intrinsics is that there aren't any temporary intrinsics. 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.
>
> (Lewis 1986: 204)

This is a muddle. There is no question of taking shapes to be relational, if this means that 'straight' and 'bent', say, may attract that description, but relational character attaches to the *verbal* component in such phrases as '*is* bent' and '*was* straight', along with more complex temporally qualified expressions, as 'is bent when gardening' or 'is straight when asleep'. For reasons already spelt out, it is not altogether natural to speak of a relation to clock times in explaining tense, but 'is . . .' may be explicated in terms of the relation 'concurrently with the utterance of "is"' and 'was' in terms of 'prior to the utterance of "was"'. But suppose it is insisted that this still leaves shape relational. Why should that hold any fears for someone attached to our ordinary way of speaking, if all it means is that terms such as 'straight' and 'bent' can occur within such predicates? *Every* tensed predicate, whether intrinsic or extrinsic, will be relational in this sense, without straining credibility. There is nothing to choose in these terms between 'This computer is obsolete'—extrinsic—and 'The boxer was surprisingly confident'—intrinsic. Note how Lewis moves from speaking of bearing a shape in relation to some *times* to the claim that, considered apart from its relation to other *things*, the enduring thing has no shape at all. Credibility is strained only if 'relational' is construed as 'in relation to other *objects*'—as if something could not be square by itself, but

would lose its shape if other objects ceased to be. When it is in relation to other *times*—drunk last night, sober this morning—there is nothing remotely puzzling.

In another formulation of the objection to the commonsense view the terms 'Lewis-straight' and 'Lewis-bent' are introduced in accordance with the following conditions:

(1) Lewis-bent has the property of being bent
(2) Lewis-straight does not have the property of being bent

Therefore, given the indiscernibility of identicals, we may conclude that

(3) Lewis-bent is not Lewis-straight

But since the names 'Lewis-bent' and 'Lewis-straight' are supposed to refer to Lewis, it also seems that the following propositions are true:

(4) Lewis-bent is Lewis
(5) Lewis-straight is Lewis

But then, given that identity is transitive, it follows that

(6) Lewis-bent is Lewis-straight

which contradicts (3).

This argument is reminiscent of a puzzle about identity posed by the marble which is initially a statue of a mermaid and subsequently one of a shepherd, when identity of each with the block of marble would seem to imply identity of mermaid and shepherd. This account overlooks the fact that a statue is not simply a block of marble, but a block of marble with a certain shape or form. Change that shape or form and you have a different statue. The present puzzle is resolved equally easily.

The terms 'Lewis-bent' and 'Lewis-straight' can be taken in two ways. First, 'Lewis-bent' may refer to Lewis only with respect to the time at which he was bent. And analogously for 'Lewis-straight'. In this case, each differs from 'Lewis', which picks out the person when straight as well as when bent. An odd way of using names, to be sure, but on that use we do not have the identities (4) and (5) which led to a contradiction. Second, our usual use of the name—free of the temporal restriction—may be in play, (1) expanding as 'Lewis, when he is bent, has the property of being bent', and (2) as 'Lewis, when he is straight, does not have the property of being bent'. But then Lewis, when he is bent, is still the same person as Lewis, when he is straight. (3) is thus false, but not a consequence of (1) and (2).

This argument seeks to show that our conception of endurance over time is incoherent. We can devise an analogous argument, less contrived but no more successful, which purports to find an incoherence with respect to relations holding at the same time. Consider:

(a) The Spanish sun is fierce
(b) The English sun is feeble

Therefore,

(c) The Spanish sun is not the English sun

On the other hand, we have

(d) The Spanish sun is the sun
(e) The English sun is the sun

Therefore,

(f) The Spanish sun is the English sun

(c) and (f) appear to contradict one another, but only so long as the peculiarities of 'the Spanish sun' and 'the English sun' are not taken into account. The intended readings of (a) and (b) may be given by:

(a*) The sun is fierce in Spain
(b*) The sun is feeble in England

and the reading of (c) in line with these amounts to a conclusion which does not stand in opposition to (c), namely,

(c*) The sun is not in Spain as it is in England.

We have given some indication of failings in the temporal parts approach, failings which are particularly acute if the view is coupled with the claim that there are no enduring bodies, just a succession of temporal parts or stages. These cannot then be temporal in the sense of existing *for* a time. That would give them the standing of an enduring, if short-lived, particular—just the kind of item which recourse to temporal parts seeks to avoid. On the other hand, if it is a matter of something which exists only *at* a time, a temporal part will diminish to an item of merely point-like dimensions, an item which could not be straight, bent, or subject of any of the other properties that a three-dimensional object may possess.

A further objection, important, if not so clearly damaging, goes back to our account of temporal ordering. How is extension in time to be

understood? Various terms may be enlisted in trying to convey what is involved, as with *growth, prolongation*, and *augmentation*. These, however, have the disadvantage of suggesting that with the passage of time we build upon a reality which continues in existence as it grows or expands into the future. In this respect, the notion of *succession* is preferable; it does not suggest something existing being added to while losing none of its reality. But now we have to ask how succession forces itself upon us, why we are precluded from regarding the relevant happenings as simultaneous. So, suppose we give a specification or description of two temporal parts, two ostensible phases in the space-time history of a person or object. How do we know which of the phases specified pertains to the earlier history of the person or object? How do we know that the phases do not exist simultaneously? Our earlier discussion claimed that an ordering required a temporal development from earlier to later, whether the events be themselves part of such a development, or mapped onto one. This makes clear the importance of an abiding *subject* of change. So long as there is nothing that is now *F*, now not-*F*, we can consistently assign the same time to either state, and it is just such a basis that is lacking if we have no more than temporal parts. That will not be unwelcome to someone wishing to adopt a static conception of the universe, but it disqualifies the temporal parts approach from providing an equivalent to our ordinary conception.

These may or may not be telling objections, but the matter is of no great importance, given the abject failure of the problem of temporary intrinsics to cast any doubt on that conception; or, if you wish, given the non-existence of the problem which temporal parts were introduced to solve. Finally, it is worth making explicit the likeness of the discussion in this section to the debate concerning tenseless truth conditions for tensed propositions. We were presented there with analyses which might be thought of as, in some sense, alternative renderings of the latter, but the issue became more contentious when the possibility of these analyses was taken to justify a rejection of objective truth for tensed statements. Temporal parts readings of more familiar linguistic forms may likewise be advanced as alternatives to those forms, but again the further step of finding fault with the latter is without justification.

5

The Past

Time being, for Leibniz, no more than the order of succession among events, it has the character of a relation rather than, as in Newton's scheme, that of an independent substance. We have looked at relational character principally in terms of a relation to an observer, or to things said by an observer, and with questions of reality to the fore, but there are also rather different questions concerning the reality of the past and the future. We shall now follow these up, first with respect to the past.

5.1 PRESENT AND PAST REALITY

Proponents of the tenseless theory of time see an unwarranted bias towards the present in the claim that only present events are real. However, on the face of it, this is nothing more than a triviality. Other events *were* or *will be* real. Yesterday's pain, the B-theorist insists, is no less real for not happening *now*. But again this should be: *was* no less real. To say this is not to consign the pain to the realm of fiction or fantasy, but simply to take the tense of the verb 'to be' seriously. Discussions of the reality of past and future are frequently blighted by a preoccupation with 'real' in the predicates 'was real' and 'will be real', when it is almost invariably the verbal forms 'was' and 'will be' to which attention should be directed. True, 'Past (future) events are real' could feature tenseless 'are', but triviality persists in its expansion to 'Past (future) events are, were, or will be real'.

According to Michael Lockwood, being real 'in the fullest possible sense' is an attribute only of what exists or is occurring now, what existed or occurred in the past being real only in a 'second-grade' sense; but that is more than can be said of future beings, which are not real in any sense (Lockwood 2005: 2, 56). However, there are not two senses of 'real' or two kinds of reality, but two uses of 'is': a tenseless use, which subsumes 'was (real)' and 'will be (real)', and a tensed use, which does not. If we are to subtract any implication

of present existence, 'are real', said of past individuals, can mean no more than 'were real'. To pick up an earlier point, it is a matter of a contrast such as that of 'real' with 'fictitious' or 'illusory', when it may apply to individuals existing at any time. This does not give us the supposed contrast with the future, but we can say that the next gust of wind will be real just as readily as we can say that the last gust was real, and if we can say of one that it *is* real, we can say it of the other.

'The past is real' is of course uncontentious if all it means is that various events really did take place, that not all our memories are illusory, not all our historical records in error. And, of course, the past can be very real *to* someone, someone perhaps who lives in, or is stuck in, the past. Unfortunately, much of the argumentation in favour of the reality of the past involves refusing the interpretations on which it is a harmless truth—or failing to acknowledge their existence—while defending forms of words on whose standard interpretation it is patently false. Or, conversely, it is allowed that, say, 'Only present things exist', can be regarded as a trivial truth, but insisted that there is a more profound 'ontological' interpretation—though one as yet to be given—on which it is false. But if all this means is that we can refer to things not presently in existence, then we are back in the realm of truths, if again trivial rather than profound.

The grammatical platitude that only present events are real draws a connection between 'present' and 'are'; it does not have to be 'real' that complements the verb 'to be'. We might equally, and equally uninformatively, observe that only present events are taking place now, that only a current noise *is* deafening us, however deafening past noises *were*. Compare the question: why do we only ever act, think, and have experiences in the present? This is not a question about the 'metaphysics' of time, but is to be answered by noting the relation between the present tense in 'have experiences' and the phrase 'in the present'—just as it is appropriate to say that we *had* experiences in the past and *will have* experiences in the future. And, of course, such grammatical observations do not tell us anything about time; there is no implication that it is in any way questionable to refer to or to 'quantify over' non-present objects and events; linking 'present events' to 'are real' does not determine just what is to fall in the scope of 'the present'—a very elastic term—nor does it tell us what events can be reckoned co-present with a given event, and so forth. Nothing can be extracted from the platitude that bears upon the intelligibility of absolute simultaneity, for instance, or indeed upon anything else of substance. It does no more than correct nonsense. But that at least it does.

But, surely, these observations are not in accord with the special theory of relativity. The set of events that are real, as I speak, is the set of events simultaneous with my utterance, and that set is not well defined. But while 'the set of events simultaneous with *x*' can be problematic, its extension uncertain, there are contexts in which it poses no problems. We do not have to be able to make sense of absolute simultaneity to warrant its every use. Even if there can be doubts as to what counts as a present fire, it remains true that only present fires *are* burning.

The objection based on the rejection of absolute simultaneity may occur in the company of the rejection of a cosmic *now*. Does that mean that there are *nows* in other frames that are earlier or later than our *now*? 'There are' cannot here feature a tensed 'are'; it is not, 'There are, as I speak, many *nows*', for, as simultaneous with my words, any *now* is simultaneous with my *now*. If, on the other hand, 'There are many *nows*' is tenseless, then it is of course true, and we do not have to go outside our reference frame to show its truth. We have all the past *nows* to draw upon. It is again, rather, that simultaneity—and hence what counts as the present—may not be defined across reference frames.

St Augustine considered that the present has no length: 'For if it were so extended, it would be divisible into past and future' (1943: 272–3). Dummett agrees: 'The present has no duration: it is a mere boundary between past and future' (2004: 74; cf. 1991: 6). So, far from the present being all that is real, it has shrunk to a durationless line or point. What, then, are we to make of such phrases as 'the present week', 'my present intention', 'in present circumstances', 'the present generation', and so forth? We can reasonably ask for clarification from one who speaks simply of 'the present'—the present *what*? Dummett is presumably thinking of the present instant or the present moment, but if these are without duration, it is thanks to 'instant' or 'moment', not to 'present'. It is true that, if we talk about, let us say, the present or the current negotiations, or the negotiations taking place at present, then we can shift at once to the past tense, saying that they *were* or (more naturally) *have been* taking place, but it is not the possibility of this shift that matters for the applicability of 'present', but the possibility of continuing to say *are* taking place. As just indicated, Augustine thought that if the present were to have a finite duration it could be subdivided into earlier and later, phases which cannot be present together. But, of course, the present day, week or, month does thus subdivide, with no risk to their reality.

Obvious though it is, the point merits further emphasis. The misconception under attack is that the present, however elusive it may be, has a determinate length, the problem being to ascertain just what its extent is. It may be a knife-edge instant, it may have an essentially psychological reality, being what we are capable of taking in without the sense of time passing. These and other characterizations may have application, but not as identifications of that elusive quantity, the unqualified present. The present lacks a determinate length because 'the present' is an indeterminate description. Add a suitable completion—'the present century'—and you remove, or at least lessen, the indeterminacy. Those who ignore this point risk being embroiled in further confusions concerning questions of objectivity, the arbitrariness of what we are to reckon as the present being taken to mean that the very notion is infected with subjectivity.

The connexion drawn between 'present events' and 'are real' is, as I say, one which will hold with adjectives other than 'real', but 'are *F*' is not restricted in its application to present items, such predicates as 'are famous', 'are revered', and 'are unrivalled' being ascribable to individuals no longer in existence. And 'are real' and 'is real' are not entirely excluded. We may perhaps say that Atlantis is a real, historical city—though 'was' would be more natural—but, on the supposition that the city has been destroyed, the focus is then not so much on temporal concerns as on the character of Atlantis: it is not real, in the sense that it exists at the present day, but we are speaking of a real, rather than a merely fictional, city. But, really, a *once* real city.

While tenseless forms may equate to a disjunction of the tensed possibilities, there is also the reading provided by a timeless truth such as 'Argon is one of the inert gases', a proposition not subject to vagaries of time which would have it now true, now false. Something like this could provide a possible, though not very helpful, model. Again, our use of 'there is' and 'there are' reveals considerable flexibility, such a form as 'There are mathematicians who have contributed to philosophy' being not impossible, even if the relevant mathematicians are long dead. If some 'ontological' conception of existence is desired that may have application to individuals not currently in existence, then this use may fill the bill. But there is nothing contentious, no deep truth, to be had here: we are just talking of a use of the phrase in which, in terms of tense, it has much the same force as 'some'. The same point applies if it is insisted that, for there to be a relation between two events, there must *be* two events to be related. This use of 'be' is indifferent to past, present, and future; there is no conflict with the truism that what is taking place is what is taking place now.

Compare Le Poidevin's claim: 'All times, and hence all the individuals occupying them, are equally real' (1991: 4–5). This need carry no threat to common belief. Individuals are said to occupy space or spaces rather than times, but presumably what is meant is simply that the individuals exist at the relevant times, in which case we shall be speaking of real individuals. Times, too, can readily be thought of as real. True, we could imagine a fictional time, in the sense of 'era', and 'at a time before the Big Bang' may well not pick out a real or genuine time, but I presume Le Poidevin is thinking of such less exotic times and dates as '29 February 2004' or 'Ten to five on New Year's Eve, 3003'. These are real times, in the sense that the descriptions are genuine specifications of times—unlike '29 February 2005'—and in this sense we may not think of times as ceasing to be or coming to be real: we do not have to wait for the relevant day to dawn before the second becomes a valid specification of a future date and time. In the same vein, 'my maternal grandfather's half-cousin' could pick out a real person, so to that extent, times and the individuals occupying them could be said to be equally real, though once more, where it applies, 'were real' is to be preferred.

Similar remarks are pertinent to Russell's declaration: 'Past and future must be acknowledged to be as real as the present' (1918: 21). In terms of their reality, there is in one sense nothing to choose between things that existed in the past, those that exist now, and those that will exist. They respectively were, are, and will be all real. This can be summed up by saying that they are all (tenselessly) real, but it is a summing up, not a fourth possibility. Use a tenseless 'are' if you wish, but that does not do away with tensed distinctions; it is simply silent on them. Real events are events which really do occur, something we can say whether we are envisaging past, present, or future happenings.

The thought behind this cluster of views may be as follows. To be real, it suffices to be, say, an occupant of the physical universe, whether in the past, present, or future. It is a matter of timeless membership of a certain category of being. Someone who dissents is thought of as treating being real as an attribute which an object might lose while remaining in other respects the same. But this is wrong: once real, always real; there is no becoming mythical or imaginary, for instance. Thus Smart, writing in the twentieth century:

> Reality is not a property which anything can acquire. To be real is to be part of the universe, and if the universe in the twenty-first century contains a certain thing or event then that thing or event is surely real. To say 'an *F* is real' is just to say

'$(\exists x)(Fx)$' with tenseless 'Fx'. (It is of course the case also that the quantifier 'there is an x' has to be read tenselessly.)

(Smart 1981: 142)

But, of course, while a real being cannot cease to be real while continuing to exist, ceasing to be real by ceasing to exist is not continuing in being whilst acquiring a character which would destroy the very identity of what had been real. There is again a steadfast refusal to respect the distinction between 'is real' and 'will be real', a distinction which is not obliterated by reading 'is' tenselessly.

It is not appropriate to speak of different metaphysical views when one party says that the past or future is real, whereas the other denies this. It is not appropriate if it is simply that the latter view is sensitive to the distinction between 'is real' and 'was real' or 'will be real', whereas the former ignores it. Or again, if a sense of 'is real' *can* be secured with respect to non-present entities, as, with some diffidence, we suggested for 'Atlantis is a real city', it is again not a metaphysical thesis that has been vindicated. We have simply drawn attention to a way of speaking which makes sense of the desired condition.

The resources of the language are such that a linguistic form which a philosopher favours may, contrary to first appearances, have an interpretation on which it is true. The difficulty lies, not in what language can provide, but in the perversity of those who will have nothing to do with anything thus sanctioned, indeed who appear to regard accord with a commonly accepted interpretation as a ground for refusing the help it offers to their otherwise doomed pronouncements. Or, on the other hand, everyday locutions are rewritten in a way supposedly true to their original meaning, and fault then found with the new forms. So, a present-tense statement, as 'We are now ready', becomes 'Our readiness has the property of presentness', which is dismissed because of its obscurity or supposed unwanted implications. A reason, surely, for thinking again about the propriety of the paraphrase.

In a remarkable passage, D. H. Mellor writes:

But how can we refute the idea that actual *B*-facts vary, either because events at t do not exist before t, or because what is future does not exist, or because—as so-called *presentists* believe—only what is present exists? Here we must avoid being misled by the variable spelling of the English verb 'exists'. For if we contrast 'exists' with 'existed' and 'will exist' by defining it as 'is present', we shall make it a mere tautology that only what is present exists. Similarly, to define 'exists before t' as 'has a *B*-time

earlier than *t*' makes it a mere tautology that events located at *t*—and hence *not* earlier than *t*—do not exist before *t*.

(Mellor 1998: 20)

But, of course, these *are* no more than tautologies, a status which cannot be dismissed by relegating distinctions of tense to the category of 'variable spellings'—as if the difference between 'exists' and 'will exist' were of no greater significance than that between 'colour' and 'color', or 'mediaeval' and 'medieval'.

5.2 McTAGGART AND THE UNREALITY OF TIME

The thesis that time is unreal may have more than one meaning, depending on whether, in McTaggart's terms, it is the *B* series (earlier than, simultaneous with, later than) or the *A* series (past, present, future) that is at issue. First, we have the claim that the temporal ordering given with *before* and *after* is not a reflection of an objective relation. An objective description of a natural process may specify a development with terminal points, E_1 and E_2, but the information that, say, E_1 is the beginning and E_2 the end supposedly has no business in a scientific description. Second, the suggestion may be that any objective description must prescind from the temporal position of the supposed observer. It is this second interpretation which provides the target for McTaggart's attempt at showing the unreality of time, an attempt that is not empirically based, but has the marginally more plausible aim of seeking to convict our usage as incoherent. McTaggart claims that everything must occupy every *A*-series position, from the distant future, through the present, to the remote past. Everything, that is, must be past, present, and future. Yet this is a patent contradiction. The predictable counter is that the predicates which apply are not the simple three instanced, but, for example, 'will be past', 'is present', and 'was future', which are not incompatible. To this McTaggart retorts that the nine predicates thus generated will again apply to every event and again in some cases be incompatible, as with 'was past' and 'will be future'. True, these in turn have to be replaced, the objection goes, by 'is going to have been past' and 'was going to be future', but McTaggart will once more generate a set of inconsistent predicates, and so on indefinitely.

Why does McTaggart think that 'past', 'present', and 'future' are incompatible predicates? Clearly, if 'is' is used tenselessly, there is no inconsistency in holding that every event is past, present, and future. But not only that. Global

warming *was* taking place, *is* taking place, and *will be* taking place. For *any* temporally extended happening such conditions will all hold at an appropriate point of time. If a leaf falls to the ground, its fall may take only seconds, but there will still have been times when each of 'was falling', 'is falling', and 'will be falling' is true. Only with instantaneous happenings—Ryle's 'achievements'—or with moments of time, will this not be so. On a natural reading of 'Nothing can be past, present, and future' this is clearly false, but a more restricted reading is called for: nothing can be over and done with, currently under way, and yet to take place. So, take a time after the leaf has fallen, so when there is no 'is falling' or 'will fall'. More generally, if an event has terminated, or has not yet come about, we can say only that it has happened or will happen. An utter triviality, of course: if the event isn't taking place, you cannot truly say that it is, and if it won't take place in the future, you cannot truly say that it will. There is not even the appearance of contradiction here, so no contradiction to be 'removed'. Setting this aside, it is clear that the logic of the whole argument is at fault on McTaggart's side. It is suggested that at each stage, while the alleged contradiction can be shown not to be such, a new contradiction can none the less be generated. But what the disproof makes plain is that McTaggart has done no more than generate a *seeming* contradiction at each stage. There is no production of anything which actually is a contradiction at *any* stage, but all that the argument keeps coming up with is a pattern of reasoning that has already been adequately discredited.

The heart of McTaggart's argument is contained in the following passage:

> Thus our first statement about *M*—that it is present, will be past, and has been future—means that *M* is present at a moment of present time, past at some moment of future time, and future at some moment of past time. But every moment, like every event, is both past, present, and future. And so a similar difficulty arises. If *M* is present, there is no moment of past time at which it is past. But the moments of future time, in which it is past, are equally moments of past time, in which it cannot be past. Again, that *M* is future and will be present and past means that *M* is future at a moment of present time, and present and past at different moments of future time. In that case it cannot be present or past at any moments of past time. But all the moments of future time, in which *M* will be present or past, are equally moments of past time.
>
> (McTaggart 1927: 21)

To point out that events are past, present, and future at different times is held not to resolve the contradiction, since times likewise have to be past,

present, and future. But if we can rescue our propositions about events from contradiction by bringing in reference to different times, we can make the same move with respect to times themselves. May Day 2001 is past, present, and future at different times, as are those times themselves, but to say that *every* time will be past, present, and future at different times is not to embark on a vicious regress but to advance a triviality as innocuous as the truth that, in the series of positive and negative integers, every number is equal to, greater than, or less than some number. Again, the moments of future time in which *M* is (will be) past are indeed moments of past time from some future perspective, but that is not the perspective from which we ruled out *M* as past at a moment of past time. Likewise, to say that all the moments of future time, in which *M* will be present or past, are equally moments of past time, just means: '. . . are equally moments of time that are past from some future perspective'. Or, to say that all moments of future time are equally moments of past time is correct if 'are' is used timelessly, and an event can be future at such a moment. 'If *M* is present, there is no moment of past time at which it is past.' That is correct, if the moments of past time are past with reference to the present. 'But the moments of future time, in which it is past, are equally moments of past time, in which it cannot be past.' However, the moments of future time in which *M* is past are not moments of past time with respect to the present; they are merely moments to which 'past' applies timelessly—since the time will come when it will apply.

Following McTaggart, Michael Dummett suggests that the contradiction has not been dispelled by appeal to the hierarchy of predicates, since at each stage we shall have the three predicates 'past in the present in the present in the . . . present', 'present in the present in the present in the . . . present', and 'future in the present in the present in the . . . present', which are equivalent to the first-level predicates 'past', 'present', and 'future', 'so that if there is a contradiction connected with the predicates of first level, the contradiction is not removed by ascending in the hierarchy' (1960: 352). Since there is no more than the appearance of a contradiction at the first level, this should not trouble us, but in fact we might well not allow the reduction to the first level. Take some past episode, say, the outbreak of World War I. This, like any other happening, will attract each of the supposedly reducible predicates, 'past in the present', 'present in the present', and 'future in the present'. Since the War is now over, it certainly falls under 'past in the present', but 'present in the present' is true of the War, not in the sense of 'present now', but only in that of 'present in a *past* present'. There is accordingly no reduction to

the bare 'present', but 'present in a past present' is simply a circumlocution for 'past'. As here used, 'future in the present' likewise means only 'future in some past present', so is not to be equated to the simple 'future'. Here, too, if there is any appearance of contradiction, it is soon dispelled. On the other hand, if 'present in the present' does reduce to 'present', we are simply back with our innocuous trio of 'is present', 'was past', and 'will be future'.

Should we allow that an event which has come about has *become* present? Or that being present is a property which something may gain and then lose? These ways of speaking are obfuscating: to speak of a future event as becoming present suggests that it is in some sense already there, waiting to put in an appearance, whereas an event is not anywhere, not able to gain or lose anything, until it takes place. Becoming warmer is a development that may take place in an object's history, something which happens to or befalls the object, but becoming present or becoming real is not. On the other hand, we may speak of something—a planned city, say—as becoming a reality, so perhaps it is a matter of steering clear of misconstruals rather than rejecting altogether such ways of speaking. After all, to say that x has become present or past need be to say no more than that x is now present or past, and was not always so.

Reference to things yet to exist may be problematic, given the uncertainty that may attach to their very existence, but this uncertainty does not make for a general proscription of such reference, and when the reference is to things no longer in existence, there is likely to be even less of a difficulty. Those who question the possibility of reference in either case purport to have at least the concept of a future or a past existent, so in order to speak of these, what more is needed than that it should be possible to specify just which item is being referred to? That can, of course, be problematic, but it can also be straightforward, as with our talk of well-known figures or persons once known to us, and there are any number of future events and states of affairs that we can readily speak of, as when we discuss the imminent transit of Venus or warn about the traffic congestion on the coming weekend. Again, given their adverbial character, there can be reason for distinguishing 'yesterday' and 'tomorrow' from referential terms of other types, but the same can be said of 'today'. There is not the further difference that 'today' has, whereas 'yesterday' and 'tomorrow' lack, a reference. Equally unperplexing is the idea that something should be the cause of a present state of affairs even though it does not now exist. There are causes whose continued existence is demanded, as with a wall that supports a roof, or a lamp which bathes a patio

in light, but most causes bring about states and happenings that survive their cessation, as when a brief flash of lightning sets fire to a barn reducing it to a pile of ashes. So long as the requisite continuity is found in the succession of events and processes linking the initial action of the cause and its eventual effects, there is nothing which is wanting if the cause itself fails to persist through to the present.

However, it may more plausibly be suggested that real or genuine changes are possible only for something that currently exists, that such 'changes' as may be attributable to something no longer in existence—as becoming famous—are no more than so-called 'Cambridge' changes, a notion introduced by Peter Geach (1972: 321–2). Such a change is one which might be said to involve no *real* alteration in an object, but which constitutes a purely relational change, as when a woman becomes a widow on the death of her husband, or when an event once forgotten is remembered. Incidentally, while we may be inclined to speak of a 'mere' Cambridge change, this can be misleading. Take motion. An object which moves undergoes a change only in its relation to other objects, but while that is not a matter of an intrinsic change, there is a real enough difference between a collection of stationary bodies and a collection of bodies in motion. Or again, a change in place is a very real change in an arrangement or disposition of bodies.

How is it with becoming or ceasing to be present? Is presentness an intrinsic property of events? Clearly, the time of an event may be central to the event's identity. I say 'may be', since it depends on what criterion of identity is being invoked. A child's first sneeze may occur when the child is a month old, but there is a sense in which it—the same sneeze under the characterization 'first sneeze'—could have occurred earlier or later. However, while identity may also be tied to the time at which it actually takes place, this does not single out the present as in any way special, but, whether past, present, or future, an event may be individuated by the time and place of its occurrence. Moreover, if 'intrinsic' is thought of in terms of 'non-relational', and if to say that something has become present is to say no more than that it is now present, the case for intrinsic character does not look strong. Present epidemics are epidemics that are raging now, and that means contemporaneous with what 'now' is taken to determine—this week, this summer, or whatever. An epidemic at another time may be reckoned a different epidemic, making time of the essence of the current epidemic, but, as argued earlier, the presentness of any epidemic is relational. As also pastness—a matter of antedating present happenings.

Somewhat perversely, McTaggart maintained that such characteristics as becoming past or present are the only genuine changes (1927: 13). If we are going to allow that when tomorrow's sunrise becomes present it thereby changes, we shall surely have to have some category of change other than the usual—as indeed 'Cambridge' changes are introduced to accommodate. True, McTaggart is speaking only of changes in events, not in things, but his treatment of the latter is equally uncompelling. A poker undoubtedly changes if it is hot on Monday but then ceases to be so, but, according to McTaggart,

> this makes no change in the qualities of the poker. It is always a quality of that poker that it is one which is hot on that particular Monday. And it always a quality of that poker that it is one which is not hot at any other time. Both these qualities are true of it at any time—the time when it is hot and the time when it is cold. And therefore it seems to be erroneous to say that there is any change in the poker.
>
> (McTaggart 1927: 15)

Here McTaggart has, rather unsubtly, changed the topic. That the poker is hot on the Monday but not at any other time is true of the poker, and will of course remain true at times when it is cold. Perhaps not a 'quality' of the poker, but certainly not the same quality as that of being hot. The latter is clearly something that can change, as McTaggart's talk of 'the time when it is hot and the time when it is cold' implies. True, a change in a quality is a change in what has the quality: not so much hot becomes cold, as that what is hot becomes cold. But change there is.

Mellor suggests that nothing really is past, present, or future in itself (1981a: 6). 'The world, I believe, is intrinsically tenseless: events and things are not in themselves either past, present, or future. Tense is only a way we have of looking at them; a compelling way, admittedly, which we could not do without, but not the way that in reality they are' (ibid., 24). We can agree that events are not in themselves either past, present, or future, given that they assume standing as all three. Similarly, a door is not in itself either open or closed, but the one constantly gives way to the other. So, is being open or closed 'only a way we have of looking' at doors, something that they are not in reality, compelling though it may be to look at them in this way?

But if we consider temporal facts, facts which make temporal propositions true, do we not find that tense no longer figures? It finds expression in our judgements, but that does not make it, or something corresponding to tense, a feature of the world. This suggestion takes us to questions of

identity concerning beliefs, judgements, and facts. Thus, if I now believe that Joan is beautiful, and in a year's time continue to believe that Joan was beautiful, there is a clear sense in which my belief has not changed, even though the judgements in which it is expressed—'Joan is beautiful' and 'Joan was beautiful'—could be reckoned distinct. Does 'fact' march in step with 'judgement' or with 'belief'? We can certainly say that it is the same fact that makes the two judgements true, but we can also specify this as the fact that Joan was beautiful when the present-tense judgement was made or as the fact that Joan had been beautiful when the past-tense judgement was made. The bare fact of Joan's being beautiful is not sufficient for the truth of either judgement; only the fact of her being beautiful contemporaneously with the present-tense judgement, and having been beautiful at the time of the past-tense judgement.

Note that we have a choice here. We can have tense contribute to the content of a judgement in such a way that 'He will succeed', say, can be said to have a different content from 'He succeeded', even though the judgements are made with respect to the same enterprise. Alternatively, we can have this sameness determine sameness of content. In general, if there is sameness there is also difference, difference in the information conveyed, as with 'We are getting married today' said thirty-five years ago, and 'We got married thirty-five years ago today' said thirty-five years later. It may also be suggested that the very different uses of the differently tensed sentences preclude any identity: 'The emotions for which the words "I will suffer severe pain", "I am suffering severe pain" and "I did suffer severe pain" can intelligibly be given as a reason are radically different from each other' (David Cockburn 1997: 79). However, while it would appear that, on their more natural readings, 'what is asserted' and 'the content of the assertion' would apply differently in the three cases, they need not for Cockburn's point to be made. The different uses depend on the verbs being tensed, or on the temporal relations being made explicit in some other way, and this can be so whether or not these relations are also reckoned to be the content of the judgement.

Back to reality. With respect to the recent past, it is understandable why some are tempted to treat it as real. If the room we have just left is real, why not the past which we have just left? Is it not just as much still there? But, of course, the only 'there' in which the past events might be is the 'there' where they took place, and that is now devoid of them. While the room we are about to enter is also now real, we do not think the same of the events about to take place in it, but that, too, is understandable: the events which took

place may be events to which we may readily cast our minds back, events which may be vividly recalled, but there is no casting our minds forward in a comparable way. Events in the past join with those in the present as events we can *report*, rather than, as with the future, merely infer. On the strength of this likeness some may wish to insist that what is past also joins what is present in being real. I should prefer to preserve the distinction which this appears to obliterate, namely, that between *is* real and *was* real, but if it is only a question of marking in this way the opposition which past and present unite in offering to the future, there need be no damage done. Recall our earlier observation that nothing more can be imported by 'real' or 'unreal' than is implied by the considerations on which these descriptions are based. What is to be resisted is the idea that in deeming the past to be real, the future not, one is putting forward a metaphysical view, or a theory about time. Whether the usage of 'real' is respected or whether we go off in a different direction, there is nothing metaphysical about a position which simply comes down in favour of drawing the line between real and unreal at a certain point, nothing deserving of the title of 'theory' either in a view which stays with actual usage or in one which advocates its revision.

And, of course, we are not spared misconceptions with respect to the remote past, where again our propensity to spatialize time may distort our thinking. Thus, thinking of Oxford as I might imagine it to have been some hundred years ago is like thinking of another place, and just as the earlier Oxford is separated from the present by a span of so many years, so a journey here from a distant place will take a certain time. The Oxford of the past, or indeed of the future, is not, I say, *this*, pointing to the streets and buildings around me. But if it is distinct from present reality, it must be situated elsewhere. Of course, this 'elsewhere' is wrong—the Oxford of a hundred years ago is 'situated' at another time, not another place, but the pressure to distinguish the present from the past Oxford naturally pushes one towards a distinction proper to different places, or to things in different places. Or again, the problem posed by the past might be expressed by the query, '*Where* do events go when they recede into the past'? Imagining something located at another place is unproblematic, and if what is thought of as temporally different is thereby sufficiently unlike it in its present form, it is easy to think of it as displaced as well.

Even to speak of 'the past', or 'the future'—rather than, say, of things as having been or going to be such and such—encourages a conception of spatially distinct *settings* for events (cf. Augustine 1943: XVII). We remarked

on the way 'the present' cries out for completion—the present *what*?—and a similar caveat is appropriate with respect to unqualified uses of 'the past' and 'the future'. The past is not something other than past epochs, happenings, states of affairs, and so forth; it is not as if the whole of the past constituted a domain separate from the present, but any domain will be to some degree common to both past and present, there being continuity in so far as what was so-and-so then has persisted into the present as such-and-such now. Within our experience, many changes take place against a largely unchanging reality, as with the abiding character of one's house. Its relative constancy from day to day takes it outside time in so far as there is no need to distinguish the kitchen as I left it this morning from the kitchen to which I return in the evening.

5.3 ANTI-REALISM AND THE PAST

If we cannot strictly speak of a past event as now real, are there then no past facts? Surely these are needed to make our statements about the past true. In the relevant sense, there are past facts in so far as there are facts about the past, and there is no shortage of these—facts such as the fact that you were born, learned to read, grew up, and so on, indefinitely. The recession of the present into the past no more makes for a contraction of the domain of the factual than it does with respect to the domain of possible objects of reference. I do not mean that it cannot make for a difference, but it is only in so far as being a possible object of reference and being a fact are epistemic notions that there is a diminution. We shall take up this question below with regard to facts. For the present, we note that the 'are' in 'There are past facts' does no more harm than it does in 'There are long-dead heroes', which amounts simply to 'Some heroes are long dead'.

Dummett suggests that, while we have nowadays abandoned the correspondence theory of truth, this theory expresses an important feature of the concept of truth which is not expressed by the law 'It is true that *P* if and only if *P*', namely, that a statement is true only if there is something in the world that makes it true (1959: 14). How seriously is the present tense to be taken here? That is, if *P* is true, must there *now* be something in the world that makes it true, even if *P* is in the past tense? Is it like the claim that, for reference to be possible, what is referred to must currently exist? Or again, is it like Augustine's claim that, given its extension into the past, a temporal

interval cannot be measured, since 'what is no longer we cannot measure'? (1943: ch. XXI) The answer, as unintuitive as with either of these questions, would appear to be Yes, Dummett claiming: '. . . for if there were, as it were, nothing whatever left of the past, then there would be nothing to make a true statement about the past true, nothing in virtue of which it would be true' (1976: 98–9; cf. 2004: 74). It is a relief to note that, while still adhering to a justificationist account of the meaning of past-tense propositions, Dummett is now prepared to consider rejecting this strong form of anti-realism (2004: ix). It is a relief, since traces which past events have left in the present are surely not what correspondence requires. While there could be present evidence of, say, a past ice age, nothing in the present could make 'There was once an ice age' true in the sense of being *the answering state of affairs* to this proposition, as the cat's being on the mat might be said to be what makes 'The cat is on the mat' true. Indeed, it would not be implausible to understand 'real' in application to the past in terms of this relation, affirming the reality of the past being a matter of insisting that certain states of affairs are *genuinely* past, not constructions out of present data. Certainly, it would be paradoxical in the extreme if the truth value of a proposition about the past were considered problematic on the grounds that it failed to satisfy the very condition that having a purely past subject matter imposed. If we are being guided by the correspondence theory, this is surely how 'what makes *P* true' is to be taken—we look to the answering state of affairs. What makes 'The children were asleep' true is the children's being asleep, but the children's being asleep at the time in question, not the children's being asleep *now*. It is not a question of *making* in a causal sense—which could indeed be more demanding with respect to continuing existence. Compare: 'Robert was Alice's father's uncle. That makes him Alice's great-uncle'. Again, the *making* relation is purely logical, and is in no way put at risk by Robert's possible demise.

There is, however, a qualification of some interest. The key to an understanding of the distinction between the simple past—'Our neighbours complained'—and the perfect—'Our neighbours have complained'—is to be found in the consideration that while 'have complained' is past tense, 'have' is none the less a present-tense form. The simple past goes with a past perspective, the perfect with a present perspective, a perspective requiring a subject that presently exists. So, in 'Our neighbours complained' the neighbours could be long-dead; with 'Our neighbours have complained' it is a matter of current neighbours. Consider now 'What makes ''Our

neighbours have complained'' true is our neighbours' having complained'. Does 'our neighbours' having complained' have a present or a past reference—supposing that we are prepared to speak here of reference? It would be reasonable to answer 'present'. After all, a statement such as 'Joan has graduated' is true in just the same circumstances as the clearly present-tense 'Joan is a graduate'. With this answer we allow that something present could be what makes a statement in the past tense true, in the sense of being the answering state of affairs, and not mere evidence.

The question as to which of realism and anti-realism about the past is the more tenable is thought to be a deep and difficult issue, but to the extent that it hinges on the claim that correspondence must be correspondence with something existing in the present, it is surely neither. Indeed, it is hard to think of a thesis more damaging to an understanding of the past than that given with this claim. Moreover, since, for Dummett, the present is durationless in extent, it is difficult to know what truth could come to for any tensed proposition.

For the anti-realist more is required for truth than is given with '*A*'s having been *F* makes it true that *A* was *F*', what makes *P* true having to satisfy an epistemic condition. On this view, a statement about the past 'cannot be true unless we know it to be true, at least indirectly, or unless we have the means to arrive at such knowledge, or at least unless there exists that which, if we were aware of it, would yield such knowledge' (Dummett 1982: 273). Suppose we extend 'what makes *P* true' to cover indirect grounds for *P*, as Dummett allows. Does that help meet our objection? It would seem not. We cannot explain what it is for *P* to be true by appeal to such grounds any more than we can appeal to such grounds in explaining the meaning of *P*. Crumbs in the cupboard give reason for thinking that a loaf of bread was there earlier, but they do not tell us what it is for there to have been a loaf of bread in the cupboard. For that we want a conceptual, not merely an empirical connection with the grounds for the assertion. On the other hand, if, as this liberal form of anti-realism allows, it is required merely that the past state of affairs be one which it would make sense to speak of knowing to be true, at least indirectly, then few, if any, propositions for which we should wish to grant the possibility of truth will be excluded. But we should have to abandon the interpretation of 'what makes *P* true' in terms of 'the state of affairs which answers to *P*'.

The idea that the past must in some sense still exist to make true past-tense propositions true is not peculiar to Dummett's strong anti-realism. Timothy

Sprigge writes: 'If there is no sense in which *that which was* is, then it is sheer nothing, and cannot provide the role of such an objective correlate' (1992: 10). But there is a sense in which something that is no longer *is* 'sheer nothing'. There would be cause for concern if there were no sense in which that which was *had been* something, but this condition is trivially satisfied. It is noticeable that Sprigge fastens on the example of a past toothache, something one may be able to bring to mind with some vividness. The sense of something still in some sense present is no longer felt if we think of less emotionally charged happenings, such as past movements of the tides or migrations of birds. If we cannot think of a thing as past without thinking of it as in some sense present, this can mean only that our thought of it as past will in general be interchangeable with our thought of it as present. Thoughts about the moon do not *ipso facto* take on a different character if it is the moon of last month or the moon of this.

A curious variation on the general theme is to be found in Jan Lukasiewicz's 'On Determinism', where he writes: 'Facts whose effects have disappeared altogether, and which even an omniscient mind could not infer from those now occurring, belong to the realm of possibility. One cannot say about them that they took place, but only that they were *possible*' (1967: 38). We should hesitate to speak of facts as taking place, and indeed as having effects, but the position still appears to be contradictory. How could facts have had effects if they were merely possible?

Mention was made above of an analogy with reference to past objects, the need for what makes *P* true to exist being like the claim that what is referred to must exist at the time reference is made. This is worth a few more words. Consider '*A*'s being *F* makes it true that *A* is *F*'. Is it possible to construe '*A*'s being *F*' referentially? We might well feel unsure as to what a referential use would mean in application to such phrases, but it would not be unreasonable to stipulate that a form of reference is involved if use of the phrase commits the speaker to *A*'s being *F*, or to its being true that *A* is *F*. This stipulation would gain point from a contrast with uses which carried no such commitment, as with '*A*'s being *F* would make it true that *A* was *F*', a form which can be likened to a hypothetical: 'If *A* were *F* then it would be true that *A* was *F*'. Some may no doubt not wish to go along with this stipulation, preferring to reserve reference for a different use of the verbal phrase. So, contrast 'John's singing was tuneless (annoying, interminable)'—where 'John's singing' is clearly nominal in its behaviour and where a particular act or action can be readily spoken of as its referent—with 'John's singing is surprising (not

in doubt)', which has the force of 'That John is singing is surprising (not in doubt)'. Here there is a factual commitment, but when, as here, 'John's singing' is an 'imperfect nominal', it does not appear that we are picking out the act which we described as tuneless. Or again, contrast 'John's singing is hard to explain' with 'John's singing is hard to listen to'. An act is being characterized in the latter case, but the possible formulation of the former as 'Why John sang is hard to explain' may discourage a use of *reference* with respect to 'John's singing' in this instance. Here 'John's singing' retains the verbal character of 'sing': it can be qualified by an adverb and/or negated, as in 'John's not singing tunelessly was surprising'.

If we are none the less happy to speak of reference with regard to '*A*'s being *F* makes it true that *A* is *F*', then it would seem we have a symmetrical use with '*A*'s having been *F* makes it true that *A* was *F*', the denial of reference to the latter surely being arbitrary if it is granted for the former, just as it is arbitrary to allow reference to someone at their wedding, but disallow it at their funeral. Indeed, we need not even shift to the form, '*A*'s having been *F*', but '*A*'s being *F*' can have a past as well as a present reference. So, not only 'John's singing is surprising', but 'John's singing was surprising'. On the other hand, if the suggested stipulation is rejected, then it is not that we have, with the present-tense form, reference to something in virtue of which a proposition might be true, yet run the risk of losing such a reference when we move to the past tense.

Back to anti-realism. In later writings, Dummett explains how a past-tense observation statement is to be understood in terms of what a suitably located observer would have observed, the justificationist element emerging in the refusal to maintain that either the relevant state of affairs would have been found to obtain or it would have been found not to obtain, a refusal backed by the claim that there need be no ground justifying either alternative (2005: 676–7). It is not clear that the meaning of past-tense statements can be explained by this account, given that an understanding of the past tense is presumed in the use of 'would have been found to obtain', but there is at least freedom from the need to find the past preserved in the present.

Explicating statements about the past by means of counterfactual conditionals is a strategy which Dummett invokes more generally, notably with respect to statements in which a disposition is being ascribed to someone. Dummett invites us to consider 'Either Jones was brave or he was not', said of a person, now dead, who never encountered danger. The proposition, 'Jones was brave', is taken to equate to the conditional, 'If Jones had encountered

danger, he would have acted bravely', and its negation to the conditional, 'If Jones had encountered danger, he would not have acted bravely'. It does not need to be the case that one of these is true, Dummett maintains, since 'it might be the case that however many facts we knew of the kind which we should normally regard as grounds for asserting such counterfactual conditionals, we should still know nothing which would be a ground for asserting either' (1959: 15). Someone might insist that some mechanism, either spiritual or physiological, would have been there to determine Jones's behaviour one way or the other, but this can be dismissed on the grounds that neither would give us the sort of fact we have been taught to regard as justifying the assertion of 'Jones was brave'.

Two points are worth making here. First, it is surely not right to interpret 'Jones was brave' by means of the given conditional. The assertion of 'Jones was brave' purports to report an act of bravery on Jones's part. It is what Jones actually did, or did not do, that matters. No speculation is involved as to how Jones would have acted in suitable circumstances, nor is the suggested conditional sufficient for the truth of 'Jones was brave'. Again, for a person to be describable as 'charming', 'secretive', 'melancholy', or 'mean', the relevant trait has to have been actually displayed; not necessary habitually, but on some occasion at least. Likewise, 'Jones was not brave' reports a failure on Jones's part to act bravely, either on a given occasion or at any time. If we are going to query the necessity of 'Either Jones was brave or he was not', it will have to be on grounds other than those Dummett advances. Second, suppose we consider the counterfactual disjunction, 'If Jones had encountered danger, he would have acted bravely or he would not have acted bravely' in its own right, and not as a proposed translation. In arguing for the necessity of this disjunction, we need not be able to cite grounds which would warrant the assertion of one or other of the propositions, 'If Jones had encountered danger, he would have acted bravely' and 'If Jones had encountered danger, he would not have acted bravely'. It is the exhaustiveness of the condition that matters: if Jones had encountered danger, then he would have acted bravely or he would have failed to act bravely. Indeterminacy aside, one or other of the descriptions would have to have been in place. For further discussion, see Rundle 1990: ch. 13.

When we are prepared to say that a past-tense statement is either true or false, does not each of these carry indefensible implications about the availability of evidence? No, I should say, if this means that we cannot coherently speak of truth or falsity in the absence of grounds from which

the one or other may be inferred. Consider the question, was your great grandfather a clergyman? You may have no idea what the man's profession was, but it is not logically excluded that records should be discovered which show that he was a clergyman; or, alternatively, that are inconsistent with standing as a man of the cloth. Perhaps not until then was there anyone currently alive who knew the answer to the question, but though no one would have been in a position to pronounce in favour of either possibility, we surely could not hold that the proposition that eventually proved true had not been so all along. We could not coherently say: it turns out that your great grandfather was a clergyman after all, but that was not so until today. A person does not become a clergyman at some point after his death, and in particular not when we come to know that he was.

Dummett states that, for the anti-realist, 'there cannot be a past fact no evidence for which exists to be discovered, because it is the existence of such evidence that would make it a fact, if it were one' (1991: 7). We may agree to this to the extent that there is a use of 'fact' in which 'established fact' is a pleonasm, but the anti-realist is surely not relying on this point of usage to make out his case. To present us with an issue of substance, he wants a use of a relevant term which carries no such implication. Whether he has that with 'fact' may be questioned, but we surely have it with 'true', and if that is so, it would seem that we are back with the mistaken claim that what makes a past-tense statement true must be something which exists in the present.

The contention that there must now be something in virtue of which a true statement in the past tense is true presents the anti-realist with a major difficulty. Another problematic issue concerns truth-value links between statements made at different times. Suppose we have a present-tense statement, 'The church is on fire', which is true at the time it is made, and that a year later someone states 'A year ago the church was on fire'. The connection between these statements is such that, if the former is now true, the latter, made in a year's time, is likewise true. This relationship is seen as important by Dummett in the realist/anti-realist debate. The anti-realist claims that 'the only notion of truth for past-tense statements which we could have acquired from our training in their use is that which coincides with the justifiability of assertions of such statements, i.e., with the existence of situations which we are capable of recognizing as obtaining and which justify such assertions' (1969: 363). However, the realist believes that, by invoking the truth-value link, he can explain how we come by an understanding of the truth of past-tense statements without endorsing the anti-realist's account. It

is, he claims, 'from an understanding of the truth-value link, as exemplified in such a case, that we derive a grasp of what it is for a statement in the past tense, whenever made, for example one made now, to be true' (1969: 363).

While accepting the truth-value link, we may query whether it can bear the explanatory weight which the realist is represented as placing upon it, since the learner has to have some grasp of the notion of a *past* utterance of a present-tense form of words in order to appreciate the link. True, in the example just given, as in Dummett's, the link relates to the condition in which a past-tense statement made at some future time *will* be true, but Dummett is explicit in taking past statements generally—'whenever made'—to be covered by the link, and this is where the seemingly damaging presupposition of understanding enters, as becomes clear with the form: 'The church was on fire' is true if and only if 'The church is on fire' *was* true.

We may also have reservations concerning the appropriateness of the truth-value link as formulated. Do we want to bring in reference to a present-tense *statement* in explaining the meaning of its past-tense transposition, rather than make do with ' "A year ago the church was on fire" is true if and only if a year ago the church was on fire'? It did not require anyone to *say* that the church was on fire when it was. This revision has the further advantage of allowing us to circumvent the difficulty which arises with such bi-conditionals as ' "There were no speaking creatures ten million years ago" is true if and only if ten million years ago "There are no speaking creatures" was true'. If that is the condition, the past-tense statement can never be true. By contrast, ' "There were no speaking creatures ten million years ago" is true if and only if ten million years ago there were no speaking creatures' suffers no such drawback.

The idea that there must somehow be something left of the past for our past-tense statements to be true joins in Dummett with an equally questionable view concerning the relation we have to the past through memory. The familiar truth that when we recall a past incident we cast our mind back to that very incident may be appealed to in giving sense to the notion that memory is a matter of a direct awareness of or contact with the past. The idea of memory as involving such contact is objected to by Dummett: 'if memory is a direct contact with a past event, which must, therefore, still exist in some manner if I am to be able now to apprehend it, how can I know that that event has not changed somewhat since it originally occurred?' (1982: 273). Direct contact is here being supposed to require continued existence of the scene remembered; we renew contact with something which persists from

occasion to occasion, possibly remaining constant, possibly not. But 'direct contact' need not be thought of in this way. Rather, it goes with the grammar of 'What I remember is . . .' as a phrase completable by a designation of something external to me, something which it makes sense to suppose no longer in existence; what I remember is nothing less than the scene itself, not a simulacrum, stand-in, or intermediary. Talk of 'contact' is, of course, highly inappropriate in any literal sense—I am using it only because it is in terms of this notion that the issue is formulated by Dummett. I take it that such talk is intended to capture what I have advanced as a grammatical truth about 'remember' and its objects, but it runs the risk of falsifying that truth as a prelude to dismissing it. Again, these remarks about 'direct contact' are not to be thought of as giving the 'common-sense' view or opinion; our concern is not so much with obvious matters of fact as with the grammatical question of what it makes sense to say.

But it is important to pay attention to this grammar. Thus, while we may be aware of *what* has happened, to say that we are now aware of last week's concert is to offer a needlessly confusing rendering of 'remembering last week's concert'. In 'aware of what happened last week', the 'what' is an *interrogative* pronoun; not a stand-in for phrases such as 'a concert', but replaceable by a clause, as in 'aware that a concert was held'. Similarly, I may remember where I parked the car or why I came upstairs, but such remembering need not have any 'object', so no object with which I am, or may fail to be, in contact. Not even an image may figure in the remembering, but my remembering where I parked the car can be adequately shown in my behaviour. Again, to show we remember who developed penicillin it may suffice to produce the name, something that we may do unthinkingly. In so far as more is needed it has to do with ruling out possible mistaken beliefs harboured by the speaker, rather than anything to do with the existence of an image.

What of the distant past? As noted, for the extreme verificationist, this is thought to pose a problem: the passage of time may make for the loss of all evidence on which the affirmation, *P*, of a past happening might be based, in which case it is supposedly unwarranted to claim that *P* is either true or false. The debate may then centre on whether the possibility of truth requires that a present verification of *P* should be possible, or whether it is enough that someone *could have* verified *P* at the earlier time. The latter is surely the more plausible, but to formulate the issue in these terms presupposes that a more basic matter of definition has been settled.

Making sense of judgements bearing upon prehistoric times, for instance, is essentially a matter of specifying a suitably continuous route back to the time in question.

To explain, consider an analogous, but more extreme case of spatial remoteness, as when we are invited to contemplate an event taking place in another universe. We are to imagine that in some world quite unrelated to our own a fire is burning. At one level we have no difficulty in contemplating the event: we are being called upon to envisage nothing different from what we might envisage in a more familiar setting. However, when the location is taken seriously, we do, of course, have a problem: we have no idea of what it is for there to be another universe, a universe spatio-temporally disconnected from our own. If it is a matter of a spatial setting whose whereabouts we can make sense of, we should wish to see a path specified which would take us from here to there, a path which, though it might be impossible to follow in practice, would at least allow the ostensible location to be defined, at least enable us to make a distinction between a real and a purely imaginary setting. This is another application of the principle that the need for definition takes precedence over any demand for verifiability.

Such dates as 7000 BC make sense to us, define genuine temporal periods, because they are part of a system which is connected by an accessibility relation. There could in principle be memories and records handed down to succeeding generations, as well as a chain of overlapping circumstances spanning the intervening period of time; it would even make sense to suppose an exceptionally long-lived Methuselah whose current memories extended back to the era in question. At all events, the date can be fixed on our scale, given intelligible co-ordinates, in a way that does not appear to be available, either spatially or temporally, for another universe. Elaborating this notion of accessibility shows how it makes sense to speak of learning what happened at the remote time, but without jeopardizing the character of the past as past, without reducing it to something in the present.

The scheme I have just outlined allows us to make sense of a certain class of judgements, but it cannot be put to the test in the way appropriate to propositions advanced within that scheme, propositions concerning matters of fact at far-off times; rather, it contributes towards characterizing our concept of the past. In this respect it is comparable with the claims that the notion of getting it right applies to remembering, that there may have been events which went unrecorded or have been forgotten. There is an indigenous hunter-gatherer tribe of Amazonian natives, the Pirahã, whose

culture is concerned solely with matters that fall within direct personal experience, and for whom there is no history beyond living memory (Everett 2008). For such people, beings with a different interest, a different focus, our scheme may hold no appeal, but there is no question of its not being true to the past.

6

The Future

What, now, of the future? Does it enjoy any reality? Again, we may swing between trivial truth and patent falsehood. We have the former if in proclaiming the reality of the future we are merely contradicting the contention that nothing will happen after this point; we have the latter if present reality is being attributed to events that are yet to take place. What about facts? Granted that events to come have as yet no reality, can there now be facts about the future none the less? Well, over the next year, the middle classes will pay higher taxes than ever before. That is not wild speculation, it is hard fact. Death and taxes present us with a depressing number of future certainties. There will be very many more facts concerning past and present than future, since our knowledge of the future is that much more restricted, but this is an epistemological, not an ontological difference. I am assuming here a use of 'fact' in which it contrasts with 'conjecture', carrying the implication that something has been *established*. This, I should say, is the way the term is commonly understood, as witness the *Oxford English Dictionary's* entry: 'Something that has really occurred or is actually the case; something certainly known to be of this character; hence, a particular truth known by actual observation or authentic testimony, as opposed to what is merely inferred, or to a conjecture or fiction; a datum of experience, as distinguished from the conclusions that may be based upon it.' If it is now said to be a fact that the stock market will reach a record high in five years time, and it does turn out that way, we should need more than this later development to say that the speaker had been vindicated. It was not at that time a fact. Similarly, if it should be said, 'Government ministers will lie to us again next year', someone may say, 'I'm sure you're right', but it may well be premature to say that the speaker has stated a fact. Again, I am stating a fact, and not mere opinion, when I say that aspirin may help in the prevention of thrombosis, but we do not obtain the same contrast if we replace 'fact' by 'truth'. Similarly, there is not the

contrast between 'truth' and 'theory' that we find with 'fact' and 'theory', and while 'fact' is opposed to 'conjecture', it is 'established truth' rather than the bare 'truth' that is likewise opposed. If, though, we can declare it to be a fact that such and such will take place, should we say that the event in question is accordingly real? This remains an infelicitous way of speaking with respect both to 'is' and to 'real'. The latter is a poor choice of description—real as opposed to what? Imaginary? Illusory? Fictitious?—but, more importantly, 'is real' surely cannot imply anything more than 'will be real'. Why bother with this ill-chosen locution instead of saying simply that the events in question really will take place? However, there is a point of interest in the consideration that the facts in question are *present* facts. We shall take this topic further shortly by examining the modal character of the auxiliary 'will'.

6.1 PREDICTIONS AND TRUTH

In speaking of 'present facts' it may be thought that I am taking the truth of a contentious thesis—there are tensed facts—for granted. 'Tensed facts' is not a happy phrase. That there has been a change in government is a fact, but we cannot say 'That there has been a change in government is tensed'. What is tensed is 'There has been a change in government', 'is a fact' and 'is tensed' attaching to different subjects. But we can ask whether a tensed judgement can state a fact, and if there are doubts about the answer in a particular case, it is not because use of 'fact' commits one to a questionable ontology, but because there are difficulties in *establishing* the matter in question. Compare 'negative facts'. If the existence of negative facts reduces to the question of whether a negative judgement can state a fact, there is no problem with negative facts, but only a question of the factual standing of a negative judgement. We shall pick these points up again in the next chapter.

It is sometimes held that statements in the future tense may be appraised as true in the present, but that 'they cannot convey singular, but only general, propositions, where statements in the present and past tense can convey both' (Ryle 1954: 27). According to Ryle, we simply do not have any future battle, eclipse, person, or whatever, to make statements about, so cannot make use of a demonstrative such as 'that', a pronoun such as 'he', or a proper name in their regard. The restrictions upon such terms

are thought by Ryle to be comparable with what we find in contexts of the following kind:

> We can say that a particular person would not have drowned had he been able to swim. But we cannot quite say that his lamented drowning would have been averted by swimming-lessons. For had he taken those lessons, he would not have drowned, and then we would not have had for a topic of discussion just that lamented drowning of which we want to say that *it* would have been prevented. We are left bereft of any 'it' at all. Averted fatalities are not fatalities. In short, we cannot, in logic, say of any designated fatality that it was averted.
>
> (Ryle 1954: 25)

Two quite distinct issues are run together here. In the first place, it is certainly true that there could be no question of referring to an actual fatality if in fact the threatened fatality had been averted. So in saying of someone, 'His drowning was prevented', we could not be referring to an event, namely the person's drowning, which actually took place. This accords with Ryle's summary of the position—'In short, we cannot, in logic, say of any designated fatality that it was averted'—but this conclusion is much weaker than the claim which it appears to summarize, namely, that in saying that the drowning would have been prevented if the person had taken swimming lessons, we cannot be designating his actual drowning. The questionable step lies in the switch to the indicative in the sentence, 'We are left bereft of any ''it'' at all'. This contention stands in need of support, since the preceding remarks show only that *if* the situation envisaged had come about, that is, *if* the drowning had been prevented, then we *would have been* left bereft of an 'it'. But the mere possibility that events should have taken a different course does not mean that we are, as things stand, left so bereft. Similarly, if I say of an island, 'It might not have existed', there is no reason why I should not be referring to that island, even though this possibility would have been ruled out had it not existed.

In similar vein Ryle rejects the inference 'I can bottle up my laughter; therefore I could have bottled up *that* hoot of laughter', arguing 'For it would not have been a hoot at all, and so not *that* hoot, had I bottled up my laughter. I could not logically have bottled *it* up' (ibid., 26). Ryle is perhaps supposing that reference to the given hoot goes hand in hand with thinking of bottling up as an act that bears upon an actual hoot, but this is no more true of bottling up a hoot than it is of producing one. Compare painting a portrait or composing a sonnet, activities which result in a portrait or sonnet rather than require their prior existence.

A person speaks truly if he says that there are some Roman coins buried in the field and there are, even though neither he nor anyone else knows that this is so. On one use of 'fact', he has not stated a fact, supposing this knowledge to be lacking, but if a prediction proves true, is that enough to warrant a claim that it was true at the time it was made? Certainly, if we have any use for 'then' in 'What he said was then true'—to make a contrast with, say, 'turned out to be true'—we should probably not consider the observation to be true when made just on the strength of later developments. Again, while the truth-value links discussed in the last chapter strike many as unquestionable, it would not be absurd to hold that, if Nostradamus had prophesied war in the Balkans last century, he would not have stated a truth if, while it came to pass as predicted, he had had inadequate grounds for that prediction. But if, say, 'Taxes will rise' is not assured of truth at the time of utterance, even though it proves true, it is not clear why this should be so. Is it required that the speaker should have had adequate grounds for his prediction at the time it was made? Perhaps, but we do not make that demand of someone who affirms a past-tense proposition. One who says that house prices rose last year, and they did, will be said to have spoken truly even though the grounds for his pronouncement are woefully inadequate.

In fact, it would appear that our concept of truth may have application with respect to a prediction even when there are no good grounds for that prediction. Consider the following. We think of the verb 'to be' as having present tense 'is', past 'was', and future 'will be', but it is worth noting that 'will' itself enjoys a past tense in the form of 'would'. Take a relevant use of the latter, as in 'The judge would soon learn that he had been wrong'. We can affirm this while supposing that, at the relevant time, there were no grounds for affirming 'The judge will soon learn that he was wrong', so no grounds for a judgement that the prediction was true at the time it was made. However, if the former is true, the latter, it would seem, would also have been true. This is clear when there are adequate grounds for the future-tense statement, as with 'Easter will be early this year', but such grounds are in no way necessary.

Lukasiewicz wrote:

> If everything that is to occur and become true at some future time is true already today, and has been true from all eternity, the future is as much determined as the past and differs from the past only in so far as it has not yet come to pass.
>
> (Lukasiewicz 1967: 22)

The temperature of the planet is now rising. Was it true in the past that this would be so? I can see only two interpretations of this question. First, the past prediction, 'The temperature of the planet will be rising in 2020' can be said to have been true when made if it eventually proves true, whatever the evidence for its truth, or lack thereof, at the time when made. Second, past truth may be thought of as truth that can be ascertained before the event, a condition that is in general much more demanding, though readily satisfiable in favourable cases, as when we say that that the grass will be longer next week or that someone will reach retirement age next year. Note that in these latter cases, 'true then' need not mean 'true eternally', since there could have been a first time when the prediction could be established.

If the second interpretation is adopted, then something that is true from all eternity could conceivably have been established as true as far back in time as you care to go. An unlikely eventuality, but if truth of *P* has been thus determinable, we might well say that it is as much determined as any past truth—which, for instance, receives overwhelming confirmation from records and memories. But if the truth of *P* can be established before the event, then, surely, what *P* predicts is inevitable. Of course. If there are steps we can take to prevent *P*'s fulfilment, then it will not have been an established truth at the earlier time. A difficulty arises if, thinking of truth in the first, totally undemanding way, we couple this reading with the determinist claim: if, so long as it proves true, our prediction *P* can be reckoned to have been true at any time it was made in the past, then *P* is as much determined as any past truth. Hence fatalism. But this is not determination in advance of proving true, as we might have if there were compelling grounds in the present for affirming *P*. Allow that a proposition predicting a future event is true now, and, it is claimed, you can do nothing to prevent that event. But what determines the prediction's truth is what happens at the later date, not anything that takes place in advance of what then happens.

Appeal to the law of excluded middle does not make for significant complications. It is thought that, 'There will be a sea battle tomorrow' being either true or false, then either the battle's occurrence or its non-occurrence is inevitable. If we follow the second interpretation of truth, which would have us regard a prediction as true when made only if its truth can be established at that time, then neither this proposition nor its negation need be true, so no grounds for inevitability either way. If a proposition can be deemed to have been true at the earlier time if it proves true at the later, then one of the

pair of propositions will be true, but its truth will not be the consequence of anything which occurred prior to the event predicted.

6.2 CONDITIONALS AND MODALITY

The division of cases suggested for the use of 'true' is of interest in application to conditionals. Take 'If you follow the doctor's advice, your blood pressure will fall', and suppose that the person addressed does follow the advice and that his blood pressure does indeed fall. On one way of looking at the prediction, it may not be true at the time of its making, but it can be regarded as having proven true even if the advice was very poor advice, based on evidence which in fact made the fall in blood pressure unlikely. The speaker may not have been justified in what he said, but it has come to pass as he predicted. Conversely, even if his grounds for the conditional were very strong, it would clearly be falsified if the advice were followed and there was no fall in blood pressure. Here we can say that the truth value of '*Q* if *P*' is the same as the truth value of *Q*, if *P*. However, while we must wait to see what happens on fulfilment of the antecedent of the conditional before appraising it as true or false, these terms may also be applied on a different basis, namely, on the strength of the grounds we have before the event for thinking that *Q* or not-*Q* will prove true on fulfilment of *P*.

Consider now a subjunctive conditional of the kind to which we may revert if we consider fulfilment of *P* unlikely, or even impossible, as 'If you were to follow the doctor's advice, your blood pressure would fall'. Such conditionals, it is said, cannot be 'barely' true, but there must be some statement, not involving the subjunctive conditional, whose truth renders the counterfactual true (Dummett 1976: 53). And that, surely, is so. If we do not consider fulfilment of the antecedent as a sufficiently realistic possibility to be taken into account, all that would remain as a basis for applying 'true' would be a grounding in general considerations linking the eventualities specified in the antecedent and consequent. As already noted, there need be nothing contentious in such a claim as 'If you were to follow the doctor's advice, your blood pressure would either fall or it would not'. There is nothing contentious if this is backed by the observation that whatever happened on the doctor's advice being followed, it would be describable one way or the other. That, I should say, is a more natural way of treating the conditional

than supposing that its truth require that we have adequate grounds for one or other of 'If you were to follow the doctor's advice, your blood pressure would fall' and 'If you were to follow the doctor's advice, your blood pressure would not fall'.

Back now to present facts and the present tense. As applied to such forms as 'walks', 'plays', and 'sings', the phrase 'present tense' might be thought to be something of a misnomer. These forms do not standardly report a narrowly present happening, but, it may be said, are used with reference to habitual or customary actions, as with 'I walk to work' or 'She plays the cello'. The label has a better fit with continuous or progressive forms, as 'I'm walking to work' or 'She's playing the cello', where ongoing acts or episodes are ostensibly characterized. However, it is not the case that 'habitual' is always in place, but there are uses which are more properly related to the present, to the time of utterance. So the 'narrative' or 'historic' present found in sporting commentaries—'Zeppo sends a long ball to the midfield'—is naturally invoked with respect to short-lived acts where the progressive form would imply that the episode was continuing to take place while the commentator was speaking. Here we may note the more philosophically interesting examples of psychological verbs, as in 'I hear', 'She knows', and 'They suspect', and performative uses as in 'I conclude', 'I deny', and 'I promise'.

We should capture a greater range of uses of the non-progressive form if we spoke of an 'extended present'. Consider the pairs, 'He looks his age'/'He's looking his age', 'It works'/'It's working', and 'I hope to be there'/'I'm hoping to be there'. In each case there is a contrast with the use of the progressive form to describe something ostensibly going on right now. There may in addition be an implication of habitual behaviour, but this description is not always apt for the given examples, which, beyond this contrast, have in common only that they pertain to a broadly defined present. This characterization may remain apt even if there is little scope for a contrast with a progressive form, as with 'The Minister bears responsibility for the deception'. In the context of a conditional, the reading appropriate to the present-tense form is dictated by the verb in the accompanying clause. So, contrast 'If I run, I get out of breath' with 'If I run, I shall get out of breath'. The habitual reading is appropriate to the former; far less likely with the latter. The behaviour of the past tense is also of interest here, the use of 'past' inviting scrutiny in such forms as 'If I ran, I would get out of breath', but the question which I wish to raise relates to the use of the non-progressive form in the antecedent of

a conditional, as with 'wins' in 'If Horse Feathers wins the race, I shall be a rich man'. How is this use to be explained?

It is sometimes thought that occurrence of the present tense in such a context is simply a quirk of English idiom: logically, this 'wins' is future-tensed. That this is an error is soon seen by contrasting the form with one in which the future is explicitly used, and where the present would give the wrong sequence of tenses: 'If Horse Feathers will win the race, you would be advised to back him'. Not: 'If Horse Feathers wins the race, you would be advised to back him'. When the present tense is used, the concern is to draw attention to the consequences which will supposedly ensue upon the realization of the event specified in the antecedent. With the future, by contrast, we remain—paradoxically—in the present, our concern now being to base an inference on the future predictability of the event in question. To put it less paradoxically, we use the present tense when envisaging the happening from a perspective at which it is present, the future tense when envisaging the happening from a perspective at which it is future (see Dudman 1984). These differences in perspective may be reflected in the main clause as well as in the if-clause. Compare 'If the treatment will cure you, it is worth taking' and 'If the treatment cures you, it will have been worth taking'. If the view being criticized were correct, we should expect to find the future tense with such temporal conjunctions as 'when', 'once', 'before', and 'as soon as', but in English we meet only with the present: 'As soon as he arrives, . . .', not 'As soon as he will arrive, . . .'. We also note that an episode can be envisaged as past, as well as present, from a future perspective, as with 'If he has left when you arrive, . . .'. And, just as present and future differ, so too do perfect and future perfect, sentences of the form just illustrated contrasting with 'If he will have left when you arrive . . .' with respect to the matter of grounds. With both contrasts we meet with subtleties which an analysis in terms of truth conditions obliterates. The use here of 'has left' does not, of course, oblige us to reject 'past-tense' as a characterization of this verbal form. As indicated, it is simply that we may have past from a future as well as from a present perspective.

It is important to note that, while an assertion that *P* tends to carry an implication that the speaker is warranted in what he says, that it is a matter of knowledge rather than anything less, this implication does not carry over to the use of *P* in subordinate clauses, unless, somewhat exceptionally, it is explicitly marked. To claim, with the anti-realist, that the concern signalled with 'If *P*, then *Q*' is a concern to indicate a consequence which follows on

the supposition that P is *known* to be true is simply to ride roughshod over the clear, and clearly legitimate, distinction just drawn. The wrongness of this claim becomes apparent if we consider qualifications which, like 'probably', relate to the grounds for an assertion. It makes good sense to say 'If Horse Feathers will probably win, you would be advised to double your bet', but 'If Horse Feathers probably wins, you would be advised to double your bet' is at best an ill-chosen variant of this form. Likewise with 'If Horse Feathers will certainly win, you would be advised to double your bet' as against the inapposite 'If Horse Feathers certainly wins, you would be advised to double your bet'. When the antecedent, *P*, features the present tense, we are, as I say, being invited to consider what may follow upon realization of *P*. The crucial consideration is the following: as a mere *supposition* of a way in which things might turn out, *P* is not appropriately accompanied by a qualification suited to the case where there is an actual affirmation, so where the question of the basis for the affirmation can be raised. Since in saying 'If Horse Feathers wins the race, . . .', the speaker is not claiming that the horse will win, the question of his entitlement to do so does not arise. This is not to say that that question is never pertinent. On the contrary, a concern with it is precisely what is marked with 'If Horse Feathers will certainly win, . . .', where we seek to draw out the consequences of something hypothesized as known from a present perspective. Likewise, again, with the bare future, as 'If there will be a full moon in three days time, . . .'. Here any consequence drawn will be based on the supposition of advance *knowledge* of a future state of affairs, and not on its mere realization, but this derives from features special to 'will', not from features which pertain to conditionals generally.

There are cases where the conditional can be definitively established at the time of utterance—in the sense that it is as readily established then as at the time of fulfilment—and here the present tense may be used, as in 'If Easter is late this year, then we shall have a longer vacation' and 'If your passport expires in six weeks, you should apply for a new one now'. These are recognizable by the occurrence of the present tense when the antecedent stands alone: 'Easter is late this year', 'Your passport expires in six weeks', and they may provide particularly clear instances of present facts having a future reference. However, this use of the present tends to be invoked only if some human planning, intention, or arrangement is the basis for the future event, an association which is even stronger with the present continuous, as in 'Roger is arriving (working, performing, appealing, resigning) tomorrow'. So, 'The return match is taking place tomorrow' or

'The return match takes place tomorrow', but 'The eclipse will take place tomorrow' rather than 'The eclipse takes place tomorrow' or 'The eclipse is taking place tomorrow'.

The modal character of 'will' is worth a few more words. I use 'modal' with respect to verbal forms or adverbial phrases which make for a qualification of assertoric force, as with 'certainly', 'possibly', or 'probably'. The modality may be channelled through an adverb, as with these examples, or through an auxiliary verb, such as 'may' or 'must', or a verbal form such as the subjunctive, or, in some languages, a form of the verb used when, for instance, what is being affirmed is based on hearsay, observation, or deduction. With the present and past-tense declarative forms, the association, in their assertoric use, with ostensible knowledge, is strong; so strong that, if it is a matter of probability only, of a judgement which rests on grounds that fall short of conclusiveness, it is appropriate to introduce a modal qualification. So, even though we know that death cap mushrooms almost invariably live up to their name, we should not say, 'Since the mushrooms Mary ate were highly poisonous, she fell ill'—supposing we do not have independent knowledge that Mary fell ill—but we should prefer 'Since the mushrooms Mary ate were highly poisonous, she doubtless fell ill' or 'Since the mushrooms Mary ate were highly poisonous, she must have fallen ill'. If it is, as we should say, no more than an *inference*, this needs to be signalled in some such way. Again, consider 'The chairman always speaks first. Thomas was chairman, so he spoke first.' This might be said by someone who witnessed Thomas speaking first, and is concerned to give the rationale for what he has observed. If, however, the person was not there to see what took place, but is offering the conclusion merely as an inference, it would be appropriate to rephrase that conclusion as 'so he will have spoken first'. This maintains the deductive pattern, but at the same time acknowledges the indirectness of the grounds, the absence of direct verification.

Consider the proposition, 'Their plane will be touching down round about now'. Although 'will' is commonly associated with a future reference, the event here in question is supposed roughly contemporaneous with the utterance. None the less, 'will' recommends itself when the speaker's evidence is much as it would be for a future happening, when the form 'Their plane is touching down round about now' would give the impression that the speaker was in a position to make a report of established fact. The same use is, of course, found with negation, as in 'They won't be ready yet', and it carries over to the form with 'would': 'Their plane would have been touching

down round about then'. Indeed, with precisely the same evidence as led to asserting the version with 'will', and with nothing more than the passage of time, we may make the transition to this form.

Again, compare 'You will have noticed that I am wearing a tie' with 'You have noticed that I am wearing a tie'. Even though, we might say, the person can hardly have failed to notice that the speaker is wearing a tie, it could be that the second form is unwarranted. It would be unwarranted if he had given no clear sign of noticing this, but although that may be so, affirmation of 'You will have . . .' may be none the less justifiable. If, in the circumstances, the person could hardly have failed to notice, the fact that he did not make this apparent need not matter. The appropriation of 'will' to this use is interesting. Once more, I am inclined to explain it by saying that the analogy with what holds in the straightforwardly future case, with respect to the degree of support implied for the affirmation, lies behind this extension. A further point of interest concerns the truth conditions of either. Their meaning is clearly different, but they are true and false in just the same circumstances. And not just in the way that 'He will sign' and 'He has signed' may be verified or falsified by the same happening. There is no comparable difference in the temporal perspective. Differences between the perfect and the future perfect can be added to the earlier examples of distinctions in tense invoked to show how the detenser's renderings of tensed forms may be unable to capture relevant differences amongst the latter.

Note that, as far as truth goes, the unqualified verbal phrase remains in focus. Suppose you have not noticed that I am wearing a tie. Then my claim, 'You will (no doubt, probably) have noticed that I am wearing a tie', is one you may reject with 'No' just as readily as you would reject 'You have noticed that I am wearing a tie'. None the less, the former forms remain preferable: I am in error, but at least I have not laid claim to a position—one in which I have more compelling grounds for what I say—to which the unqualified assertion is appropriate. It may be wondered how a speaker can make justified use of the future perfect when he would be criticized for employing the perfect, given that both stand or fall together as far as truth is concerned. On my account, it is the matter of justification, not that of truth, that defines the difference between the forms.

The point of difference between 'was' and 'will' which we have been touching on—'was' often signalling a report of a past happening, 'will' being grounded in present evidence—connects with the stronger attachment we have to the reality of the past than to that of the future. How can we cast our

mind back to a past scene if it is not somehow there for us to revisit, if only in thought? A parallel question does not arise with respect to the future, since we cannot project our mind forward to future happenings in a way that rests on an experience of those happenings. My claim is that to put it this way is to misrepresent an epistemological difference as an ontological one: however clearly I can recall some past episode, that is no ground for saying that it enjoys a current existence, let alone an existence denied future happenings. None the less, not only may our undoubted knowledge of the past lead us to credit it with a present reality, but we may be further led to suppose that past and future would be seen to be on a par, each equally real, if we had a faculty of precognition which mirrored that of memory. We shall take up this question shortly.

We have noted certain features of 'will' and 'would' which are not shared by 'was'. There are other uses of the future auxiliary—'shall' rather than 'will'—in which different contrasts are at issue, notably in the context of practical reasoning. In the following argument we are seemingly presented with two differing 'shalls': 'I want to be sure of arriving on time, and I shall be late if I do not set the alarm, so I shall set the alarm'. The first 'shall' would commonly be described as 'predictive', whereas the second is used in expressing an intention. Here the speaker is unlikely to be drawing out a consequence of the premises, not concluding or deducing that he will set the alarm, but expressing an intention to do so in the light of the necessity of the action for attaining his goal (See Rundle 1997: 101).

However, this characterization cannot be quite right, since the intentional use also qualifies as predictive. Can we then divide the uses into the *purely* predictive and the intentional? But it is still not clear that this is correct. There is an undoubted difference between 'shall be late' and 'shall set the alarm' as they occur in this context, but is it right to make 'shall' the locus of that difference? Consider the present-tense form, 'We are annoying the neighbours'. This could be said in response to 'What are you up to?', when it answers by specifying an intentional action, but it could be that while we are indeed annoying our neighbours, that is no part of any plan on our part; it just happens that what we are doing has this result. If the distinction with the present tense is found in the two uses of 'annoy'—an intended and an unintended act—should this not carry over to the future case? Just one 'shall' in 'We shall annoy our neighbours', whether this a threat, a promise, an expression of intention, or simply a statement of what we expect to result from our actions.

To find a more persuasive reason for distinguishing uses of 'shall', it is useful to consider interrogative forms. If I ask the doctor, 'Will I recover?', I am seeking to find out what my future holds; if I say 'Shall I continue to take the tablets?', I am asking for advice; not asking him what will happen, but asking him what I should do. This use may be explained in the following way. If the action in question is not one that poses any difficulty in its execution, the relevant query is appropriately directed to its desirability rather than to its feasibility. If there were doubts as to the latter, a form such as 'Will I be able to continue to take the tablets?' would recommend itself. Since utterance of the form 'Shall I *V*?' gives us to understand that, in the agent's view, it is up to him whether he *V*s or not, to respond with Yes is not so much as to say that is what will happen as to endorse the wisdom of acting thus. As indicated, in this use 'shall' comes close to 'should': 'Shall I raise my bet' does not enquire as to what the speaker is going to do, but what he should do.

6.3 PRECOGNITION

The preceding discussion has touched upon points of difference between the past and future tenses. Underlying these differences are facts concerning how and to what extent past and future can be known, facts which give rise to an apparent asymmetry between the two domains in terms of their respective reality. One of our theses is that an asymmetry in this regard is illusory, but, as suggested earlier, we might be inclined to consider past and future to be on a par if we had a faculty of precognition which mirrored that of memory. Perhaps it is just a contingent fact that we lack such a power, that we cannot as readily direct attention to the future as to the present. Perhaps past, present, and future are, as it were, all laid out as in the block universe, and it is only because of our limitations—an inability to take in anything beyond present happenings with any vividness—that we see the present as uniquely privileged in terms of its reality.

I speak of a faculty that mirrors memory, but it could well be that what is envisaged—as the picture of future happenings laid out before us suggests—is more a matter of a direct knowledge of such happenings akin to perception, the kind of knowledge which, on Aquinas's view, God has of events in time. God does not come by knowledge of events successively, but everything that has happened, is happening, or will happen is eternally present to him. By contrast, a relation which qualified as the mirror image of memory

would have to bring in an analogue of knowledge *retained*, and not be simply a matter of the *acquisition* of knowledge of the future, as precognition is usually thought to involve. If memory is a matter of knowledge acquired in the past and which we can now bring to mind, express, or manifest, then precognition will be a matter of knowledge to be acquired in the future and which we can now bring to mind, express, or manifest. Conversely, if memory were comparable to precognition, as commonly understood, then it would enable us to cast our mind back to scenes which we had never experienced. Is either ostensible knowledge of the future conceivable?

The answer would appear to be No in either case, and for the same reason. Whether our foreknowledge is or is not subsequently followed by knowledge of the relevant episode at the time of its occurrence, there is no way of making sense of the initial acquisition of that knowledge. Take first the matter of our knowledge of the past. It would seem that we could make sense of an awareness, akin to memory, of a scene we had never experienced, and that our description could tally in every detail with a description offered by someone who had actually experienced the scene. What is difficult to understand is how it would be possible to come by this knowledge. The scene is no longer there to impinge upon us, to engender our awareness of it, and by hypothesis such awareness is not, as with memory, to be explained by appeal to our original experience of the scene. Knowledge of something that does not exist, in the sense of 'no longer exists', is dependent on knowledge gained when it did. When it is a matter of 'does not yet exist' there is no question of retained knowledge which we might now enjoy, no question of our current awareness being dependent on our future acquisition of knowledge.

If we adopt a causal theory of knowledge, then knowledge of the future of the kind here envisaged—direct rather than inferential knowledge—is logically precluded. Such a view is tempting. Without a causal link, it would appear that one's ostensible knowledge of a future happening or state of affairs could owe nothing to the latter's being as it will be. The only remaining relation would appear to be one of conformity to what transpires, with no way of excluding mere chance agreement. But even if our concepts of knowledge and perception can be analysed without making appeal to causal notions, we know that in fact causation is bound up with perception, and hence with knowledge gained thereby; that, for instance, it requires light and sound waves to impinge upon eyes and ears if we are to see or hear. Even more clearly, the knowledge acquired through touch and taste requires actual physical contact. However sight is to be analysed, it is logically impossible

that we should experience tactile sensations occasioned by an object that is yet to exist. More generally, it becomes incomprehensible how we might come to acquire direct knowledge of the future, just as it is incomprehensible how we might acquire direct knowledge of past events which we did not experience at the time. In neither case can we say that we came by the knowledge through seeing, touching, hearing, or the exercise of any other of our faculties by which knowledge is gained. Causation is central to these acts, but even if it is not bound up conceptually with them, there is enough to defeat their exercise in the fact of the absence of what is to be experienced. Perception is a physical, not a spiritual transaction. Of course, precognition need not, any more than memory, be thought of as a form of perception, but just to deliver the same information. However, the question as to how such information is acquired seemingly remains unanswerable, such acquisition being either logically excluded or at best inexplicable.

Suppose that there could be a form of awareness of the future akin to memory—perhaps indistinguishable from the latter beyond the fact of a different temporal reference. The lack of such precognition and the possession of memory are not to be explained by appeal to the unreality of the future and the reality of the past respectively. It is the *retention* of knowledge gained that makes for memory and excludes precognition, but that is not a matter of the present reality of the past as against the present unreality of the future. We can say of future events only that they will be real, but then we can say of past events only that they were real. Or, suppose that precognition is taken to be with respect to an event that will never fall within our experience, and that we can likewise have a 'memory' of an unexperienced past event. The supposed reality of the past makes the latter no more intelligible than a precognition of an event that will never fall within our experience.

Although such pronouncements as 'Past, present, and future are all equally real' are, if taken at face value, patent nonsense, there is equal scope for going astray in explaining how past, present, and future differ. Is it that the past, in opposition to the future, is *fixed*. Is that perhaps the reason why it can be known, but not changed, why backwards causation is ruled out? On the other hand, the future, being open, determinable by us, there is as yet nothing there to know. But, clearly, we cannot change the future any more than we can change the past, talk of changing being in place only when something which is so and so is made to be otherwise. But of the future we cannot say that things *are* so and so, and will be altered, and in so far as we can say that they *will* be so and so, we exclude the possibility of making them

to be otherwise. Clearly, too, we cannot say, with respect to the past, that something currently exists 'there' to be known, and while we may say that we know what has happened, there is symmetry in talk of knowing what will happen. It makes sense to speak of having intentions for the future, but not for the past, not because the past is fixed and unalterable, the future yet to take shape, but because 'bring about' and related phrases have, through their involvement with causation, an exclusively future orientation.

Precognition is sometimes thought excluded through coming into conflict with our freedom of action, with the view that the future is determinable by our decisions and choices, a view seemingly at odds with the contention that, if I were to foresee myself engaged in a certain activity, there is nothing I could do to stop this coming about. Yet surely it is up to me how things turn out in areas where, as here, I exercise control. However, it is precognition only if what is ostensibly foreseen does in fact come about. I could *seem* to foresee contracting malaria, and since at this point that is all I need take it to be, it makes good sense for me to take steps to avoid this happening, if that is what I want. If I succeed, then it was seeming only. And if I fail? Then it was genuine foreknowledge, at least as far as the condition of eventual truth is concerned, but it was not in that event the genuineness of the knowledge that, unbeknownst to me, stood in the way of my taking steps to avoid this. As though any strategy I might adopt would keep coming up against this ineluctable fact: the event has been foreseen, so it is logically impossible that it should not come to pass. That it is foreseen awaits finding out whether in fact it takes place. It is not an advance fact which places curbs on what is possible.

Contrast the supposed difficulty for freedom when the foreknowledge is divine foreknowledge. That a being should know what is going to happen is not in general a troubling consideration. Why should not one of the things known be that you are going to act freely on a certain occasion? That, after all, is something we too may sometimes know about one another. What makes for the worry is, rather, the supposed character of God's knowledge: he is to be aware of the happening in question in the same way as he might be aware of a present or past event, so aware of the event as a reality, not as an inference. Since, moreover, he is a being incapable of error, there is no mere *seeming* to know, but any attempt at avoiding the future happening is doomed to failure.

Perhaps divine foreknowledge is not a complication which we have to face, but is there not something of the same difficulty for us, despite the

above argument? After all, I am supposing the knowledge to be direct rather than inferential, and while there is no question of human infallibility, if our precognitive acts were very largely reliable, would that not inevitably, and rightly, lead to a change in our views concerning power, freedom, control, and the like? So, I try to encourage you to bring about such and such a state of affairs on the grounds that your seeming knowledge that this will not come about could prove illusory. Indeed, it is up to you, I urge, to ensure that just this is its standing. However, your well-nigh faultless dependability in these matters may give you reason to dismiss the possibility I am urging. Given your past record, you may feel that to take my suggestion seriously would be about as rational as an atheist calling upon God to save him from impending disaster. In either case, there is no real expectation of salvation; it is merely that, the situation being so desperate, anything is considered worth a try.

We should not let go of the idea of the priority of fact to knowledge. It is not that a future occurrence is to be deemed inevitable because we already know that it will come about. Note the possibility here of a misplaced modal. What is logically necessary is that, if the event is foreseen, then it will take place. Not: if the event is foreseen, then its occurrence is a logical necessity. However assured our ostensible knowledge is before the event, it makes sense to suppose that it is a matter of nothing more than belief, and it accordingly also makes sense to take steps to ensure that the seemingly foreseen consequences do not come about. But it could also be that this is not the appropriate way to deal with the difficulty, that we should rather, as indicated, exploit the possibility that it is precisely a free action that may be foreseen, in which case there is no threat which it takes the illusoriness of our seeming knowledge to defuse.

And this, I believe, is correct. To summarize a longer argument, free action may be understood as, in Hume's words, action in accordance with the determinations of the will. I do not interpret this causally, as did Hume, but it is a matter of action which manifests or expresses, rather than is brought about by, one's wishes or desires. In short, acting freely is a matter of doing as one pleases, doing what one wants to do (see Rundle 1997: ch. 9). And there is no reason why action of this character should not be foreseen. If the foreknowledge of it is genuine, we can infer that we shall not want to do the opposite, and that is not a cause for alarm. If someone can rightly say that I shall *V*, I may regard this as a challenge to refute the prediction, and that course of action may be within my power: I most assuredly can do precisely

the opposite—if I want to. It is just that, if the prediction is correct, I am not going to want to. Think here, not so much of a prediction of action, but of a prediction of the associated state of mind: you will find the case for *V*ing quite overwhelming. If that is so, and if the ability and opportunity are not wanting, you will assuredly *V*. The prediction of *action* strikes us as more of a threat to our freedom, since we imagine ourselves striving unsuccessfully to achieve the opposite of what is supposedly in store for us, but if, as with free action, what is predicted is a desire to act in a certain way, then we are simply looking forward to an occasion when our rationality will be manifested. If that is so, it will take a patently *un*free act to refute the prediction. It is the possibility that we shall be *thwarted* in trying to do what we want to do that puts our freedom at risk; if we succeed, that threat is lifted.

But if we were to have present knowledge of future events, would it not then be *pointless* to do anything with a view to bringing such events about? Not, of course, if our knowledge derives from our intentions: we know that *E* will occur because it is in our power to ensure that it does, and we are determined to do just that. It is to be a matter of knowledge of the future that mirrors knowledge of the past through memory. But, once more, the question will then be whether we *do* or even *can* know. It may be that *E* will not transpire without our efforts, and that we only *seem* to know of its occurrence. If we do then act, the coming about of what we had ostensibly known would come about does not show our efforts to have been unnecessary. The asymmetry with the past has been preserved. The possibility that I may be in error when I claim to recall that *E* took place does not give point to my doing something now with the aim of ensuring that it did. Nothing I now do will count as achieving that.

Compare knowledge about present or past. If the horse has bolted, there is no point in shutting the stable door, but if there is any chance that I am mistaken in thinking that the horse has bolted, it makes sense for me to take steps aimed at preventing the unwanted happening. There is not an exact analogy here, in that there is nothing one can do to bring about a past happening, whereas there may be much one can do to influence the future course of events. However, there is an analogy in so far as the ostensible knowledge that makes action futile can be had with respect both to past and future, and may be no more than ostensible in either case.

7

Grammar and Ontology

Our non-metrical scheme offers the possibility of judging two events to be contemporaneous if neither occurs before the other. There is no need to find a third item—a time—on which to map two such happenings if they are to be pronounced simultaneous, but when we do have times on which to effect a mapping, this is a benefit yielded without our having to go outside the domain of simultaneous events or episodes. It is just that some of these—those associated with a timekeeper—are accorded a special standing. They are used to define a standard, common points to which happenings generally may be related and through which the latter are related to one another. Just as occurrence *at* a time is secured by taking a particular instance of the primitive notion of simultaneity, so going on *for* a time will be explicable as an instance of one of our primitive relations: we have an event which begins with phase *A* and ends with phase *B*, and *A* and *B* are now paired off with events given with our privileged system, with our clock. Prior to the introduction of clocks we do not have a concept of something happening *for* a time, any more than we do for *at* a time—where these are generalizations on such particular forms as 'for 2 minutes' and 'at six o'clock'—but a use for both the general and the particular specifications comes automatically once clocks are in use. There is not a further entity—time—posing a problem which the clocks are brought in to resolve, something to which they are to answer, with which they are required to conform. What is basic is past, present, and future, the refinements which come with talk of time being, by comparison, of less moment. The advance to our more sophisticated temporal system will bring with it new *concepts*, but it is not an advance that requires the making of an empirical discovery—as if there were something which had been there all along but which had up till this point passed unnoticed. Rather, a technique, a system of measurement, will have been introduced. Or so I would suggest. However, to concede this claim is to concede the heart of a very different view from the absolutist conception which has exercised such a strong attraction on many, the conception built around the view—seemingly no more than

is implicit in our temporal language—which regards time as a self-sufficient quantity awaiting measurement, an all-pervasive feature of the universe which clocks inescapably draw to our attention, but which antedates any system of time keeping, which may exist even without objects, let alone without changing objects. The conception, in short, of time both as what is measured and as what does the measuring. And, in a sense, much of this is correct. The problem is to make clearer the respects in which we have truth and in which we have falsity.

In Chapter 4 we broadened our discussion of time and space to take in more general epistemological issues. In this and the following chapter we shall also range more widely, topics in the philosophy of language being to the fore in this chapter, and matters of metaphysics in the next.

7.1 ABSTRACT NOUNS AND CLAUSES

What temporal puzzles might exercise the philosophers of our pre-metrical community? Without further elucidation, we cannot say that members of this clockless society could be surprised how much or how little time had elapsed since some incident—though they could be surprised that a certain episode was or was not over. They could ask whether past and future are real, and they could wonder whether it makes sense to enquire about what is happening now in far-off regions of the universe; they could discuss the analysis of *earlier* and *later*, and the possibility of time travel, but they could not succumb to the idea of time as itself a process alongside others, nor could they raise the question whether there could be a time when the universe did not exist. This suggests that, while there is no question that time is unreal, some features of the metrical concept determine it as a construct which cannot be explained without reference to a human artifice, a system of chronometry. Our discussion will, I hope, indicate to what extent this is so by showing in what sense it is wrong to conceive of time as some species of 'object' which our clocks are introduced to measure. We shall soon find that it is grammar, in a fairly literal sense, that allows us to suitably formulate, and to some extent resolve, this question.

While the language of our more primitive community may have no term translatable as 'time', it may none the less be insisted that time is what these people show themselves to have some grasp of, is what they compare events in respect of in their rough and ready way. So if it is not in respect of time,

in respect of just *what* are the flash of lightning and the rumble of thunder being compared when it is said that one went on for longer than the other?

Consider the spatial analogue. Suppose we formed comparative judgements of length only by placing object against object. So long as no object was selected as a standard, we should have no use for 'is *n* units long', but we could still speak of one thing as being as long as, or longer than, another. Length is here a form of spatial extension in the same sense as when rulers are in use. Likewise with weight. Without a system of weights and scales we have no metric, but we can still speak of sameness and difference in weight. The same holds even with number. There are just as many *A*s as *B*s if the *A*s and *B*s can be paired off one to one without remainder, and this mapping can be understood and accomplished without having recourse to particular numbers, numbers which would give a measure of the totalities. Similarly, there can be more of the *A*s than the *B*s if the latter can be mapped onto a proper subset of the *A*s, again a conception which can dispense with numbers and counting.

In the temporal case we have the comparative analogues: *x* goes on for just as long as, or longer than, *y*. We are not to expand the former as '*x* goes on for just as long a time as *y*'; none the less, we can be said to be comparing *x* and *y* in terms of their *duration*. Or we may speak of *x* as *outlasting y*. If we are going to speak here—not altogether appropriately—of time, then knowing what time is is knowing in respect of what magnitude these happenings *x* and *y* are being compared, and that is ultimately a function of two simple things—presence and absence. Compare, further, the length of a body. Here we have, for *u* longer than *v*, absence of *v* along a certain range of points on *u*; for *x* temporally longer than *y* we have non-occurrence of *y* while *x* persists or endures. We have *x* with *y*, then *x* without *y*. That is all there is to the idea of *x* outlasting *y*. Or at least that is so when the briefer event occurs within the span of the longer. Whether, in a clockless society, we can make sense of other possibilities, will be considered in the next chapter. Time in the sense of 'duration' can be acknowledged prior to the advent of clocks, even if the concept of time is not then as it figures in the use of the verb 'to time' or in the questions 'What is the time?' and 'How much time do we have?'. We have now to consider the sense in which talk of time none the less does not introduce anything essentially new. This amounts to addressing the question of what it is that we measure when we measure time.

The two key points to be developed in tackling this question soon prove to be related as it emerges, first, that the terms which are used in specifying

what clocks measure behave as clauses rather than as names of objects or substances, and, second, that in exhibiting this clausal involvement we bring out the way in which measuring duration is always measuring the duration of *something*; not some problematic entity, but *how long* some unproblematic happening lasts.

We shall work our way around to these points by considering the character of 'ontological' issues more generally. Such issues are often approached in the following way. We have some broad category of *object* or *entity*, along with a number of disputed claimants for the title. Whether that title is conferred is then thought of as a question of what the needs of some theory dictate. This is usually not such a cut and dried question as that of whether such and such exists, as this might arise in ornithology or astronomy, say, but the pressure to postulate the relevant entities varies, depending on what the needs are and what alternative postulates are available. It is essentially a pragmatic approach, born of a scepticism concerning what we can affirm as indisputably existing along with a consequent belief that an affirmation of existence can be based on no firmer grounds than a demonstration that acceptance of the relevant items proves fruitful for some purpose. So, we may not be enamoured of abstract entities such as numbers, but if our mathematics and our science cannot get by without them, they can be acknowledged, however grudgingly.

However, given the mismatch between the concepts of what is needed and what there is, this approach is misconceived. Things do not spring into existence in response to a need, nor go out of existence when the need is no longer felt. True, there is a sense in which we might need to suppose the existence of x, not because x would be useful, but because its existence is actually implied by other truths, but we cannot say that x does not exist on the grounds that there is no purpose for which it is required. Consider the example of events. We meet with what might be regarded as the central use of 'event' in such phrases as 'a strange event' and 'witness an event', but we also find a number of idiomatic uses, as with 'in the event of . . .', 'after the event', 'at all events', and so forth. That there are events is assured by the truth of suitable propositions featuring the term 'event', and that there are such is not subject to serious doubt. After all, to deny that there are events is tantamount to saying that nothing ever happens. But is the issue so clear when we forgo the loose ordinary language sense of 'event' in favour of a stricter philosophical usage? Whether there is such an alternative is of no relevance to our concerns, the use of 'event' in formulating the problems which concern us antedating any philosophical reinterpretations of the term.

Note, incidentally, that the question is whether there are events, not whether events exist; they do not, events being said to take place, not to exist, but that is not the kind of consideration that one who rejects events would exploit. Whether you need them or not, innumerable events take place; what may or may not be needed—but which has nothing to do with this matter of fact—is a word with the meaning of 'event'. It would be difficult to dispense with such a term in what I have indicated as its central use, though the more idiomatic uses are perhaps more readily replaceable. This sort of nonsense is treated in greater length than it probably deserves in Rundle (1979).

In passing, it is perhaps just worth mentioning an alternative to the widely accepted account of the logical form of propositions about events due to Donald Davidson (1967). The proposition, 'Jones buttered a piece of toast in the bathroom' has as a trivial consequence, 'Jones buttered a piece of toast', but, trivial though it may be, its derivation appears not to fall within the scope of first-order logic, a difficulty which Davidson meets by recasting the former as 'There is an event which is both a buttering of toast and is in the bathroom'. It is now not necessary to go outside the confines of predicate logic to deduce 'There is an event which is a buttering of toast'. Likewise with 'Jones buttered a piece of toast at midnight', 'Jones buttered a piece of toast with a knife', and so forth.

Davidson's approach is thought to have the merit of providing a uniform treatment of a range of inferences which have otherwise to be dealt with piecemeal, but, while not questioning the legitimacy of the transformations, we might wish to give a rationale for the inferences which does not require us to go beyond the original forms of words. That is readily provided. A statement may be qualified in such a way as to leave the statement minus the qualification intact; alternatively, the qualification may result in a cancellation or modification of assertoric force. So, we can infer 'He died' from 'He died in his sleep', but not from 'He almost died' or 'I hope he died'—sentences which, we may note, are resistant to Davidson's analysis. Again, while one who says, 'If you don't mind me saying, you're putting on weight' is committed to 'You're putting on weight', the general pattern for 'if' does not sanction detachment of the main clause: 'If you work hard you will succeed' does not imply the bare 'You will succeed'. On the other hand, such detachment is possible for a proposition containing a parenthetical 'I know', as in 'There are, I know, other solutions'. Likewise, incorporation of the phrase 'in the bathroom' in 'Jones buttered a piece of toast' leaves the commitments of the latter intact. This account of the rationale for the inference naturally joins

with an account of *and*-elimination along the same lines. The addition of 'and *Q*' to *P* does not make for any diminution of *P*'s assertoric force, hence its extractability, and we can make analogous moves with other moods. In 'Open the car and put in the case' the second imperative does not have an effect on the preceding words which might lead us to say that opening the car is no longer enjoined. Purely truth-functional accounts leave such contexts shrouded in mystery (Rundle 1983).

Our current concern is with one of the principal categories which, as intimated, philosophers have often wished to dispense with, namely, that of abstractions. There are important subdivisions here, but for present purposes one relevant group—we shall meet others—comprises nouns which provide variants of phrases composed of an adjective together with some part of the verb 'to be', as 'His carelessness was unforgivable' interchanges with 'He was unforgivably careless', or 'They enjoyed a long friendship' with 'They were friends for a long time'. Many of these nouns are morphologically recognizable through such endings as '-ness', '-ity', '-ion', and '-ship'. Thus, 'emptiness', 'artlessness', 'depravity', 'longevity', 'elation', 'indignation', 'membership', and 'stewardship'. Their superficial grammar places them alongside mass terms, such as 'sulphur' or 'cinnamon'. In neither case do they form a plural, quantity is expressed by the use of 'much' rather than 'many', and they tend not to accept the indefinite article. This parallel appears to have been responsible for some absurd construals of philosophically important terms, a noteworthy example being the claim that consciousness is a kind of stuff; not necessarily material stuff; something perhaps more subtle, but stuff none the less. However, the appropriate construal of 'consciousness' is as with the philosophically less charged terms. 'When did consciousness begin in human beings?' does not commit us to acknowledging an ethereal form of stuff any more than does its adjectival equivalent, 'When did human beings begin to be conscious?' Nor, unlike stuffs, does consciousness raise a question of identity, so that one might wonder whether an exact replica of a person could have the same consciousness as the person replicated.

The claim is not that the adjectival form is more fundamental than the nominal form—plausible though this may be; just that the implications of each are the same. We can imagine a philosopher balking at the use of the noun 'look' in 'His suit has a shabby look' on the grounds that it involves hypostasizing appearances. This would not sit happily with an insistence that we could equally say, 'His suit looks shabby'. If the two are interchangeable, then there is, of course, no unwanted implication of the

one that is not shared by the other. Once the grammar of abstract nouns is appreciated, their use is seen to be unexceptionable, and there is no call merely to postulate *F*-ness. Talk of postulation, which is how the universe comes to be populated once *need* becomes the determining concept, is a lazy move that does nothing for our understanding of the relevant terms and gets in the way of an account that does. As Russell remarked: 'The method of "postulating" what we want has many advantages; they are the same as the advantages of theft over honest toil' (1919: 71). We shall see shortly how temporal instants, items more relevant to our concerns, may be dealt with once postulation is set aside as a method of introduction, but for the present, and with our wider interests in view, let us look at some of the disadvantages of this method through the example of 'propositional objects', 'intentional objects', or 'objects of attitudes'. We might equally have considered mathematical entities—discussed in Rundle 2004: ch. 6—but propositional objects raise questions more akin to those presented by facts, which are particularly germane to our concerns.

Consider the statement, 'Roger explained that he had been delayed'. This may serve to give an indirect rendering of the direct speech report, '"I have been delayed", Roger explained', and it is noteworthy that in neither is 'explained' a transitive verb. Its behaviour in the direct speech construction, where it purports to characterize what the speaker was doing in uttering the quoted words, is transparent enough. Likewise with '"I have been delayed", Roger protested (objected, confessed, insisted)'. The relation between 'explained' and the following that-clause is less perspicuous, but it is not a matter of explaining the *proposition* that he had been delayed. No other characterization of the putative object appears any more satisfactory, and we should in any case want a compelling reason to parse the verb as transitive in this construction, given its intransitivity in the context of direct speech. Rather, we should wish to maintain continuity with the direct speech version by treating the noun clause as giving an oblique rendering of the terms in which the person's explanation was couched. Indeed, it is noteworthy that if a verb *requires* that there be something propositional towards which an attitude is taken, then the construction with the that-clause is in general *not* allowed. So, you can ridicule, endorse, dismiss, contradict or misunderstand my claim that the President is a great statesman, but you cannot ridicule, etc., *that* the President is a great statesman.

In the contexts just considered, the clausal construction does not introduce an object *towards* which an attitude is taken, but provides an indirect

rendering of words *with* which an attitude is expressed. Indeed, the very word 'object' may prejudice a correct account, leading us to suppose that it at least makes sense to speak of such things as Fregean thoughts, sets of possible worlds, or even properties as what are believed, explained, suspected, and so forth. If this is not appreciated, if it is thought that an object fitting the former scheme is required, the error is in no way lessened by introducing that object as no more than a posit or postulate. The grammatical framework remains equally inappropriate whether the putative object is confidently affirmed, hesitatingly conjectured, or merely posited.

Of course, postulation may be an appropriate procedure when it is a matter of conjecture whether something of a certain character exists, as an undiscovered planet in our solar system, but this presumes that we have a grasp of what the conjecture means. It is not as if someone who postulates universals, numbers, or objects of the attitudes knows what it would be for there to be such, but has as yet failed to come across any. It is sometimes suggested that Newton is simply following accepted scientific practice in postulating instants of time and points of space, but if we remain in the dark about what a Newtonian instant or point would be, it is premature to posit their existence. Likewise with Richard Feynman's supposition that electrons travel backwards in time, though here the defect is incoherence rather than lack of definition.

The verb most commonly discussed in this connexion is 'believe'. This invites a construal whereby an object of belief is introduced, since we can be said to believe propositions, reports, stories, and so forth, but we should none the less expect to be able to bring it into line with the general run of relevant verbs. Not only should we naturally expect to devise an account which sets 'believe' alongside 'suspect', 'fear', 'hope', and other verbs which cannot take propositional objects, but the parenthetical use of 'believe'—as in 'There are, he believes, several choices'—shows that an intransitive use will have to be acknowledged. When the question 'What do we believe?' is not to be answered with 'Propositional objects', it amounts to asking what completions of '. . ., he believes, . . .' are possible. A truly open-ended question, given the innumerable ways in which the schema may be completed.

When we move from noun clauses to interrogative clauses, the notion of an *object* of an attitude is even less inviting, despite a degree of noun-like behaviour on the part of the clause. Knowing who is coming is not to be compared with knowing the person who is coming, but what is known in the former case is the answer to the question formulable as 'Who is coming?'

Likewise with other interrogative clauses, as knowing why someone left or how someone travelled.

7.2 FACTS

Consider now the notion of a fact, and the similar caveats which its elucidation calls for. As with 'time', so, too, the motley of uses of 'fact' defeats any uniform treatment, but here, too, certain uses are central, and we shall focus on those that have most engaged philosophers. Just as there may be no logical objects of '*A* suspects . . .' or '*A* fears . . .', so there may be no logical subjects of '. . . is a fact'. The form instanced by 'That CO_2 emissions cause climate change is a fact' has every appearance of a logical subject-predicate sentence, but (a) specifying a reference for the clause does not seem possible, and (b) we can make sense of the construction without having to do so. As regards (a), the important consideration is that no extralinguistic reference appears to fill the bill. If suitable referents were to be found, it should surely be possible to say *where* in the world a fact is located. It is a fact that the River Danube passes through several countries, but that fact is not itself in any of them, nor anywhere else. It is a fact that oily fish is good for you, but where is that fact? It is, it might be said, a fact everywhere that this is so, but this does not mean that the fact itself is anywhere, let alone everywhere. Once more, an unquestioned presumption of locatability has much to answer for. But are not causes facts, and does not that mean that they may interact with worldly items? We can say No to both. It can be a fact that an explosion caused the damage, but the damage was not caused by a fact. But is not a causal role implied by 'The explosion is a fact'? Again, No. Compare 'The fall of the Berlin Wall is a fact'. That is not telling you what kind of thing the fall is, but, here and elsewhere, a construction with a verbal phrase is ready to hand: 'It is a fact that there was an explosion', 'It is a fact that the Berlin Wall fell'. Or again, 'CO_2 emissions are a fact'. It is a fact that there are such emissions, but we do not have 'CO_2 emissions are facts'. That is not what they are. 'Big Ben's striking is an event' may be said to place the striking in a certain category. As one might expect from its clausal subject, 'That Big Ben is striking is a fact' features a predicate in a very different role: a matter of affirming or endorsing rather than classifying.

Can we call upon linguistic items, most obviously propositions, to provide a subject for '. . . is a fact'? One who fears that *P* does not fear a proposition,

but while 'The proposition that *P* is a fact' is hardly felicitous, it is not so clearly to be dismissed. However, consider again the construction with 'believe'. To explain 'He believes he will succeed' in terms of 'He believes the proposition that he will succeed' does not take us from sense to nonsense, but it does not take us to the right analysis. Might the same be said with 'The proposition that *P* is a fact' as a rendering of 'That *P* is a fact' or of the more natural 'It is a fact that *P*'?

As I understand the term, 'proposition' is not itself the source of a problem. A proposition for me is something you can read or write, find illegible or inaudible; it contains various parts of speech, and has a grammatical structure. So 'proposition' is just another name for '(declarative) sentence'? Not quite. It is not *just* a sentence, but a sentence thought of in association with a certain *use*. What that use is may vary. Sometimes 'proposition' comes close to 'proposal'. So, 'Here is a proposition I'd like to put to you'. In philosophical contexts the use is broader, sometimes close to the sense in which we speak of the propositions in Euclid, and often even more general, as when something is put forward as a hypothesis. Talk of a mere sentence is in place when we are not concerned with any such use but with the words alone—something with a certain structure, grammar, and meaning. Moreover, the criterion of identity for propositions is not the same as that for sentences. Just as 'good day' and *bonjour* are the same greeting, so 'Time flies' and *Le temps passe vite* are the same proposition. In either case, sameness is a matter of an equivalence relation—sameness of meaning—which can tolerate differences not allowed for with strict identity.

The categorization of facts as propositions has to contend with the difficulty that propositions, but not facts, can be mistranslated or misquoted, expressed or uttered, so we cannot allow that a fact is a proposition, nor call upon 'The proposition that *P* is a fact' to throw light on 'It is a fact that *P*', though there may be a more roundabout way in which 'fact' and 'proposition' are related. This brings us to (b). If, as is plausible, we take 'It is a fact that *P*' as basic, the problem of finding a referent for the clause, or a propositional subject, does not arise. True, the pronoun 'it' has the appearance of being an anticipatory subject for the clause that follows, but it can more readily be parsed as a dummy 'it', such a sentence as 'It is a fact that CO_2 emissions cause climate change' being essentially a coordination of its two constituent clauses: 'It is a fact: CO_2 emissions cause climate change'. That 'it' is no more than a dummy 'it'—comparable with the pronoun in 'It seems that *P*'—is borne out by the possibility of channelling 'fact' through an adverbial phrase.

We renounce any claim to reference on the part of 'fact' with 'CO_2 emissions in fact cause climate change', but without any apparent loss of information. Again, a curious fact is a curious fact that *P*, for some *P*, and that is a matter of its being curious that, in fact, *P*.

This rendering, we note, works against those who wish to explain truth in terms of correspondence with the facts. First, there is the point, which I do not wish to press, that *fact* pairs up not so much with bare truth as with *established* truth. Second, the contribution of correspondence is minimal: in ' "The river flooded" is true if and only if it is a fact that the river flooded and the proposition corresponds to that fact', the clause 'and the proposition corresponds to that fact' can be omitted without loss. There is no call to consider whether we have correspondence based on the internal structure of a fact, thought of as a composite of objects, properties and relations, but all we require is that for each true proposition there should be a fact. Third, what remains appears to reduce to nothing more illuminating than ' "The river flooded" is true if and only if the river in fact flooded'.

Turning to our temporal concerns, what are we to make of the claim that a statement such as 'Pythagoras denounced the eating of beans' requires that a past fact should still exist to make it true? Both 'still' and 'exist' are awkward here, but we may agree that the truth of the statement requires that it be a fact that Pythagoras denounced the eating of beans. Once more, however, 'It is a fact . . .' does not herald a specification of a worldly item which may in time pass out of existence. 'Fact' is not like 'state of affairs', which signifies something which may continue for a time and then cease to be. But there must, surely, be something in the world that makes a true proposition true. Consider 'The audience laughed'. It was suggested in Chapter 5 that the notion of reference could be appropriated for nominalizations based on true statements, so that the audience's laughing could be said to be what makes this statement true. However, we do not have to go beyond the resources of the statement to find a suitable referent, which may be anything, depending on what is asserted. But the audience's laughing must be a fact, surely. Certainly, it must be a fact that the audience laughed, but to say this is not to say what sort of thing the laughing is. It is worth adding that, in line with the discussion in Chapter 5, we are under no compulsion to speak here of reference. It is the person's laughing, not their laughter, that makes the statement true, and this gives us an imperfect nominal which behaves much as a clause: that the audience laughed can be said to make the statement true, but such a clause is not happily placed in the category of referential expressions.

Our rejection of facts as worldly items with causal powers may have consequences for accounts of memory. Causal theories of memory take their starting point from an uncontested premise: it is not enough that a present memory impression should be an accurate representation of a past happening for it to constitute a true memory. There may be no misrepresentation of the past when I say that I remember sweeping up the leaves, but if it is a matter of no more than chance agreement, the memory will not qualify as genuine. What is needed to elevate the impression to the latter status is, it is maintained, an appropriate *causal* link with the earlier experience of the event, or, through this, with the actual fact or event remembered. Without such a link the impression remains free-floating, not grounded in the fact it purports to retail.

We have facts and events as candidate causes, and we might also add occasions and states. Given their non-causal character, facts are especially unpromising in this role, but there are difficulties which arise with any items held to figure as causes. We have two cases to consider. First, suppose you hear people talking about a meeting they had attended some time ago. What they say prompts memories in you of a similar occasion, and you begin to wonder whether the meeting you are recollecting is the one being spoken of. Your query is not whether the meeting they attended is the cause of your current memories; how could that possibly be established? Tracing a causal path from what is remembered to present impression is an impossible task, and one that could not in any case avoid reliance upon memory. What you are looking for is sufficient detail in their accounts and in your memories for the matter of *identity* to be settled. If, eventually, the details are specific as to time and place, then it is a question that may be settled beyond doubt. This is why the ability to expand upon one's memory claim is an important aid to establishing its validity. A correct reply to a query concerning a past incident may be followed by elaborations which show the speaker to be thinking of something other than that incident; conversely, to the extent that further accurate details are forthcoming, to that extent we may conclude that it is precisely *that* occasion, not just one similar in the respects initially cited, that is being recalled.

We are still far from providing anything like necessary and sufficient conditions for remembering, our observations having been directed to the particular case where, a past incident having been specified, we envisage someone trying to make good a claim to remember precisely that incident. A question of identity rather than causality, to be sure, but what of the

more general case where we are not concerned to tie up two independent identifications? When, for instance, I say I remember clearly what I was thinking about at breakfast time. An appeal to causality has again nothing to offer anyone seeking assurance that things are as claimed, but identity likewise has little bearing on the question.

One of the attractions of the causal account is, as it were, that it puts the final piece of the jigsaw in place. We have original episode and present memory impression; add the causal link, and the picture is complete, the genuineness of the memory now secured. However, while this scheme is not satisfactory, we must grant that it is not good enough simply to have a memory impression which represents the earlier event correctly. The natural supposition is that we must find some link between these two elements, so if not one of causation, then something else. I suggest that this is the wrong approach, that it is not a question of starting from such a breakdown and looking for further components to assemble. Rather, the picture is this. We have a practice of talking about past events, sometimes with confidence, sometimes not. When we are confident, prepared to stand by what we say, it will typically be that doubts have not entered our heads, the recall being effortless, the memory clear, our report unhesitating; indeed, we may be hard-pressed to think of comparable occasions when we have ever gone wrong. In such cases our claim is accorded the status of a presumptive truth, a status which it retains so long as conditions which would cast doubt upon it cannot be shown to obtain, conditions relating to our general dependability, to our present state of mind, to other circumstances which we seemingly remember and which lend support to the likelihood of what is claimed, to agree or disagree with what others say, and so forth. It is not so much a matter of accumulating evidence which points directly to our conclusion, but the approach is largely negative: we attempt to rebut any unfavourable possibilities that may be advanced. There is no way of foreseeing and neutralizing all such, but in fact there may be nothing realistic to have to counter, in which case we are fully warranted in standing by our claim. Our terminus is not a truth whose certainty has been settled once and for all, but a claim whose status as a presumptive truth has not been eroded. In the absence of counter-indications, there is simply no case to answer.

The above remarks call for considerable expansion—some of which is to be found in Rundle 1979, 1986, 1993 and 2001—but it should be clear enough that, far from constituting a non-committal, risk-free step, postulating objects of the attitudes or objects constitutive of facts serves only

to preserve and protect distorted conceptions of the relevant constructions, and to stand in the way of a correct account. There is no question of an 'ontology' of facts, bloated or otherwise. Whether we can rightly state 'It is a fact that CO_2 emissions cause climate change', is a question of the evidential standing of the embedded proposition. There is not the further question: are there such objects as facts? Such a proposition cannot fail for want of the requisite entity, but for want of the requisite *proof*. Consider putative moral facts. Is it a fact that insider trading is wrong? That is, is the wrongness of insider trading something that can be established, as we may establish that insider trading is endemic in the City? The question is not whether we can admit entities of a supposedly problematic character, as has been thought with respect to moral, temporal, negative, or disjunctive facts. Negative facts are wholly unproblematic. I have not won Wimbledon. That is decidedly a fact, and it is negative. How, it is wondered, can there be disjunctive facts, given that nothing in the world is disjunctive? It is enough for such a fact that a proposition of the form 'It is a fact that *P* or *Q*' should be demonstrably true. Clauses and sentences can form a disjunction; we do not have in addition to grapple with a problem of how the same could be true of extra linguistic items, but any complications are to be found elsewhere: even when *Q* is not-*P*, there can be argument as to whether the disjunction '*P* or *Q*' holds. Nor is there anything in the notion of a fact that renders A-series facts suspect, but I suspect that the desire to make do without tensed facts derives, at least in part, from a belief that we are otherwise committing ourselves to unnecessary, and possibly problematic, entities.

Returning to 'time' and its grammar, the important subclass of abstract nouns for our purposes relates to measurement, as with 'length', 'breadth', 'depth', 'weight', 'height', 'distance', and, of course, 'duration'. Words for properties, it may be said, so words for a suspect class of entity that we should accept only if our needs require their postulation. But this neglects the all-important grammar. Just as measuring, estimating, or calculating the depth of a pool is a matter of measuring, and so forth, how deep the pool is, so calculating the time the journey will take is calculating how long it will take, and estimating the duration of the strike is estimating how long the strike will last, both 'time' and 'duration' functioning as clauses. Usage is, of course, not entirely uniform. In a phrase such as 'a length of rope', where 'length' has a material reference, there is no question of a clausal construal. What, none the less, may lead us to align 'length', as it occurs after a verb such as 'measure', with terms which indisputably designate something 'in the

world' is its apparent closeness to phrases which, like 'the side of the bridge', undoubtedly do have that role. But the side of the bridge can be rusty, facing north, buckled and bent. The length cannot, even if the bridge can be rusty along the whole of its length. Not only does the length not occupy space; we cannot even ask *where* the length is. Measuring the side is like painting the side, in the sense that both involve doing something to it. Measuring the length is still doing something to the *side*—measuring it from one extremity to the other.

The clausal construal is important, not only for correcting misconceptions concerning constitution, but also, as this example illustrates, (allied) misconstruals concerning location. Not only are nouns too readily assumed to denominate some individual or stuff, they are with equal alacrity taken to denominate something locatable, the lack of any compelling answer to the question where, for instance, consciousness is to be found being for some a source of great unease. Again, the debate between realists and nominalists over the nature of universals may reveal a shared misconception concerning location. Thus, the realist holds that one and the same property may be located in indefinitely many places: the weight of the suitcase, say, is not confined to the case, but may be found elsewhere. The nominalist, by contrast, considers the properties of particular things to be themselves particular, the weight of a given suitcase not being something repeatable, any more than the suitcase itself. There is indeed a use of 'weight' which accords with the nominalist's conception: someone who lifts weights exercises with individual items identified by their spatio-temporal location, but on the interpretation intended the realist is right, in that any number of things can be of the same weight, or weigh the same. However, we may query whether this is a matter of the same weight enjoying multiple locations, the question, 'Where is the weight of the suitcase?' not having any clear sense. Similarly, our ability to speak intelligibly of the price of food does not require that there be an answer to the question, 'Where is the price of this fish situated?' Nor do we have to be able to make sense of the question, 'Where is the speed of a moving object?', in order to assign a speed to a vehicle, any more than our talk of consciousness requires that we be able to assign it a location. A question of location arises for the subjects of consciousness, but not for consciousness itself any more than for carelessness. Or not in a pertinent sense. We speak of carelessness in the home and we can say that consciousness is to be found in higher animals, but that is just a matter of being careless in the home and of higher animals being found to be conscious; we are not reporting the results of peering into mind or brain.

'Time' joins with 'length' and 'weight' in having both clausal and non-clausal uses, the latter being found with such phrases as 'at that time' and 'for a long time', where further specifications as 'at midnight' and 'for two hours' are in order. However, phrases like 'two hours' and 'ten seconds' have in turn to be treated with care. Consider first length, and complementary phrases such as 'two feet'. If I use a yardstick to measure two feet, in the sense of measure *off*, or lay off, two feet, then I do not measure two feet in the same sense as I measure a piece of cloth. I do not measure two feet to find out how long they are. No, but I might measure two feet to find out how long that is. More realistically, there is a sense in which I might measure a perch, a pole, a rod, or an ell to satisfy myself in just this respect, but of course I would not be looking for an answer in terms of perches, etc., but would be curious to know what such a length corresponded to in my more familiar system of units. Even here, it may be suggested, we can, without moving from one system of measurement to another, make some sense of such a query as: just how long is three and a half inches? It makes sense if we want to be shown what such a length looks like, for instance. We have a sensible query so long as the terms specifying what is to be measured and those specifying the terms in which the answer is to be given are distinguishable, and this may be realized in more than one way.

The behaviour noted with 'length' is found with other noun complements of verbs such as 'measure'. Take 'number'. Counting the number of people present is counting how many people are present, a phrase such as 'the people present' being suited to denominating the 'objects' counted. The clause 'how many people are present' no more designates the objects counted than 'who was guilty' picks out a person in 'He knew who was guilty'.

Just as two feet is not the object measured, so, too, two hours is not the 'object' which clocks measure. If I use a clock to time two hours, I will not be seeking a temporal measure of two hours, in the sense of timing the temporal period to see how long the two hours lasted, but I shall be letting my clock run for a time which might measure some contemporaneous process. True, as with spatial length, so too with time we could measure two hours to see how this translates into some other scale, but in the normal case, 'I timed two hours' is not like 'I timed the race', not a specification of what was timed—as if two hours took a certain time which was to be ascertained. If a race being timed goes on for two hours, then we can be said to have measured two hours with our clock, but there are not two hours that were measured in the way the race was. To combat the false picture of an independent quantity being

measured, something to which our clock may or may not be true, we might speak of the clock as measuring *out* a period. 'Two hours' *gives* the measure. Just as the number of eggs counted is the number in which the counting *issues*, so when time is measured, this is a matter of a form of measuring issuing in a (specification of a) time. In the sense in which we can speak of the measure of a spatial or a temporal length, it compares with 'The suitcase weighed 30 pounds' or 'The grocer charged £3.00', not with 'The shopkeeper weighed the suitcase' or 'The grocer charged the customer'.

The absolutist's view is often said to infuse our everyday thinking about time. What might as much as give us the idea that such a view is correct? Not necessarily any of the particular things said about time, but perhaps the mere fact that 'time' is a name. We speak of a long time, taking time, making time, losing no time, and to the end of time. What could be clearer than that the term names something, and what can that be other than the entity time itself? For the relationist, this is to attach a mistaken significance to the superficial grammar of the term, but how can he be sure that every statement seemingly about that unique entity, time, will give way to one in which what is said of time is replaced by a phrase referring to events or changes? There is no formula which tells us how to effect this transformation.

However, there are general points which the relationist may make. A noteworthy feature of the noun 'time' is its membership in both of the categories, *countable* and *non-countable*. Consider the sentence, 'Sound travels'. Here 'sound' is a non-countable or 'mass' noun, comparable to 'weather', 'fun', 'peace', 'elation', and other nouns which do not form a plural. While without a plural in this use, the non-countable form 'sound' may in effect provide a variant plural form, 'Sound travels', say, interchanging with 'Sounds travel'. Compare phrases with generic 'the', where a phrase specifying a single type can be used in making generalizations over instances of that type: 'The internal combustion engine is a boon', or 'Internal combustion engines are a boon', the difference being one of style rather than of content. It is useful to draw attention to such interchanges of role, since when a noun has a use which does not admit a plural—or when it is prefaced by generic 'the'—it is tempting to take it as a name of some single entity in a way that excludes it from referring to the general run of individual instances. This would be wrong. It is not that, say, 'the internal combustion engine' does not enjoy a singular reference in this use, but the way this is so with respect to a type is not inconsistent with an implicit reference to a plurality at the level of individuals. Indeed, just as we might take the latter level as basic, so too with

'time', which is like 'sound' in allowing of both countable and non-countable uses. There is some reason to regard the former as the more fundamental. So, measuring time is a matter of measuring particular times, as the time taken to mend a puncture or complete a crossword. Certainly, in representing 'time' as a name of something in accordance with its non-countable use, we encourage the more mystifying construals of the term. Not only is this the use which lends itself to personifications, as with 'Time waits for no man', but, more misleadingly, it then appears to be the name, more literally, of some stuff or substance. However, once we move to the use of 'time' as a count noun, the connection with relations between events comes to the fore. The problem of carrying out the relationist's analysis with the requisite generality is one to which we shall return.

7.3 INSTANTS AND THE PASSAGE OF TIME

The idea of time as an independent quantity waiting there to be measured, as one might weigh a volume of water, is perhaps due in part to misreading the substantival character of 'time', in part due to a misconstrual of such locutions as 'we measure time with clocks', an assimilation of this to 'we time races with clocks', or 'we measure bodies with rulers'—as though a period of time were, in its own way, like a stretch of water or a length of fabric. What we measure temporally are, roughly speaking, items in the category of events—speeches, races, journeys, quarrels, meetings, and so forth. It is to these, not to some questionable quantity, that we put a figure. The most notorious expression of this misconception is to be found in the absolutist conception of time, according to which the notions of temporal position and duration can be understood by having regard to no more than what time itself can provide; it is not required that we appeal to any happenings in time to provide markers in terms of which temporal points and periods can be fixed. Time itself is supposedly self-sufficient in this respect: a minute, an hour, or other temporal interval is simply there for us to come across much as we may come across an event which goes on for a minute or an hour.

However, hints of the misconception are also to be found even with philosophers and scientists who would have nothing to do with this view. Consider, for instance, the question: is time continuous, or merely dense? The question is whether there is any physical process which might be recruited to give a continuous measure of time, or whether density is the most that

potential clocks can provide. It is not that there is some stuff or process, time, which might be investigated for possible discontinuities; or that, time proving to be continuous, our task will then be to find a measure which can do justice to this feature. However, such issues are, I suspect, more commonly thought of on the false 'object' model: as facts are entities whose character has yet to be fully revealed, so time is a substance with various properties awaiting discovery, a substance with a character to be explored much as one might investigate smoke or fire. This perspective is particularly likely with such a query as 'What is an interval or period of time *made up of*?' The ingredients cannot be instants, since, being without duration, these cannot sum to anything having temporal extension. But if not a sum of instants, then a period must be a sum of lesser periods, and that does not take us far. May we not have to acknowledge after all that an 'assemblage of successive instants which lack duration will have a property, namely extension, that each of these particular parts lack'? (Newton-Smith 1980: 119) As already noted, Leibniz thought that time was not an 'emergent' property of successive instants, but something ideal: 'Nothing of time does ever exist, but instants; and an instant is not even itself a part of time. Whoever considers these observations, will easily apprehend that time can only be an ideal thing' (Alexander 1956: 72–3).

To say that there is such an interval as one nanosecond is to say that this interval is defined in our system of temporal measurement, that our chronometry enables us to assign that value to a suitable event. To say that time is dense is to say that there are physical processes which could mark out instants through happenings enumerable by means of the fractions and such that, given any two fractions, a/b and c/d for which $a/b < c/d$, it is always possible to find a happening with which the intermediate value, $a + c/b + d$, can be correlated. That is, such an assignment is always physically meaningful. Popularizations of science often represent time as deeply mysterious, but it is not mysterious in the way some exotic substance, having a constitution which is difficult to probe, might be, or something which behaves in unaccountable ways. The very notion of time as something difficult to fathom may embody the misconception—time conceived of as the object measured and the bearer of problematic properties.

How, more constructively, are we to deal with the notion of an instant? Suppose I let go an apple, which then falls. A state of rest gives way to one of downwards motion, and the dividing line between the two states can be used to define an instant. As the end point of a state of rest—or the initial

point of a state of motion—an instant is to temporal extension as an edge or surface is to spatial extension. Just as an edge or surface has no thickness, so an instant has no duration. And just as the last moment of rest can be the first moment of movement without our having to say that the apple is both moving and at rest at the same time, so there can be a line or edge between a red and a blue patch without our having to say that the line is both red and blue. 'Instant', in this use, is not like 'moment' as in 'for a brief moment'; nor does it denominate an infinitesimal amount of a temporal unit. The term 'infinitesimal' may be objected to on the grounds that it purports to characterize a temporal unit of determinate size yet smaller than any imaginable unit. This is a confusion; it is the very inapplicability of the notion of size that is of the essence of 'instant'. But there are brief moments, so there are amounts of time. Yes indeed, as with seconds and minutes, but such terms are to be understood as giving the measure of some happening, such as the movement of the hands of a clock. With neither 'instant' nor 'moment', understood as singling out points of time, do we have to do with quantities which await measurement by a suitable technology. This is, I take it, what Leibniz meant when he claimed that instants are not parts of time. A part of time will be of some duration, whereas an instant has the character of a limit. This furnishes a rationale for a use of 'ideal' which is not unreasonable, but it does not make for a conflict with the objectivity, let alone truth, of propositions concerning periods of time.

If we have points or instants of time we have intervals or periods, long or momentary, which these bound. The problem with the absolutist's points is that we do not know what they are. How can a durationless point be anything other than a limit, and what is there to be a limit of if we cannot appeal to events? We are not denying that there are instants; just saying that we must turn to the relationist rather than the absolutist for a satisfactory account of what they are. Note too that, whether we think of instants as being of brief duration or of no duration, they need not be thought of as collections of events. That goes beyond the requirement that there be events in terms of which instants may be defined, and when the instant is durationless, it is not an event but, as argued, the limit of an event. As with spatial points, numbers, facts, and so forth, there is no call to regard instants or periods as no more than theoretical entities. Why speak of mere theory when you can say what the relevant items actually are? And, of course, you cannot even postulate the existence of these entities unless you know what it would be for them to exist.

The concepts of something enduring, of one episode outlasting another, are not sufficient for the uses to which our sophisticated temporal vocabulary is put, but while the concept of clock time may bring with it the concept of time passing, we are not to think of the passing of time as a matter of *another* thing enduring. This observation relates to the matter of the *flow* of time. So, it is frequently said that the idea that time flows is at the heart of our everyday concept of time, and, indeed, the source of its incoherence. This is a curious claim. Apart from the occasional poetic effusion, talk of time flowing is surely rare; certainly, not a way of speaking by which anyone would wish to set great store. Time is more commonly said to fly than to flow, but even more commonly it simply passes. Indeed, the bare 'Time passes' could be styled a 'grammatical' proposition: it is of the *nature* of time, in this sense, to embody a succession—which, as we have noted, is a matter of tracking a series of events. Compare 'Events take place'. So, events are not like bodies, which may be said to exist; rather, they occur, transpire, or take place; and time is different again: it does not occur, but it does pass. If the flow of time is no more than the passage of time, we do not have a problem, but 'flow' suggests a more substantive subject—just the conception warned against when it was noted that the passage of time is not in turn an instance of something enduring. 'The passage of time' is misleading, in so far as it appears to describe an unfolding event, just another of the processes that occur *in* time, but we need not be misled.

The passage of time is not to be dismissed on the grounds that, if time could be said to pass, then we could sensibly ask at what rate it did so, and this would require a further time whereby the first time was measured. Time not being permitted to pass at a certain rate, it cannot itself pass quickly or slowly, be speeded up or slowed down. Cf. Aristotle: 'change is always faster or slower, whereas time is not: for fast and slow are defined by time—fast is what moves much in a short time, slow what moves little in a long time; but time is not defined by time, by being either a certain amount or a certain kind of it' (1984: 218^{b}15–18). However, there is the possibility, not of course known to Aristotle, that in one reference frame changes should take place faster than in another, with consequences for the duration of the time lapses based on the changes in each, and even without having recourse to relativistic considerations we can speak of the rate at which time passes by comparing different periodic successions in our own frame (cf. Lockwood 2005: 17). Those who, like Smart (1967: 126), take the view that only time—perhaps a hypertime—could measure the rate at which time

passes, come uncomfortably close to an absolutist conception, in that they appear to lose sight of the consideration that measurement of time requiring systems of regularities can open up the way for a comparison of the units in two such systems. It is not a matter of a further *dimension* of time, but of a further system of measurement, time advancing, one second, say, for every three beats of our alternative succession. Use of 'second' shows that time is being thought of as given with a clock, but suppose that instants or periods of time are taken to succeed one another without there being some associated regularity in terms of which a second is defined. The question is then not to be rejected on the grounds that the answer is trivial—time passes at one second per second—or that we have to define the rate that time passes in terms of itself. We can continue to make the same kind of comparison; the difficulty is, rather, in conceiving of such independence. On the other hand, if time in one frame is designated *A* time and time in another frame *B* time, 'At one *B* second per *A* second' may be non-trivial, or indeed false.

While it is misconceived to speak of time as, literally, stuff which flows, it would be unfair to brand this misconception the 'common-sense' view, given that it rests on a *misconstrual* of the grammar of the common language, of the linguistic practice of the ordinary person, even if the native speaker's reflections on that grammar are—here as elsewhere—more than likely to be flawed, and flawed in just this way. The picture of time as a quantity which flows is not in error because the true time is the physicist's time, and this is 'frozen'. To say this would not be simply to correct the abuse of a metaphor, but to contradict the literal truths on which that metaphor rests, truths about what has happened, what is happening, and so forth. It may be that an event which is in our future lies in another being's past, but such a possibility does not contradict our statement that *A* was earlier than *B*, made to others sharing our perspective, any more than this contradicts a statement made in another reference frame. The worry is sometimes expressed that the physicist's time seems somehow remote from the time of our everyday life. Here it is important to recall that the reality to which our temporal concepts relate is as in the primitive society envisaged: facts about past, present, and the ordering of events as earlier and later. Our more sophisticated system of measurement does not disclose new realities, though there is room for surprises in the way it organizes the more basic data, surprises which stem from time's dependence on change. If changes uniformly speed up or slow down, we can, in suitable circumstances, expect there to be repercussions for the extent of time elapsed.

My objection is an objection to reading a certain grammar into 'time', a grammar which compares 'measuring time' with 'counting apples' rather than with 'counting the number of apples'. Add to this the image of the river of time and you have a quantity which clocks measure and which flows. A false picture, but there need be nothing amiss with the notion of time flowing as a mere metaphor, rather than as a notion which does literal justice to the behaviour of the supposed quantity. As a metaphor, it does not embody a thesis about the nature of time, but it can be enlisted by a relationist as readily as by an absolutist. However, there is a question of *what* we are aware of when aware of the passage of time. Again, look at the grammar: being aware of time passing is not like being aware of the passing traffic; it is being aware *that* time is passing. It is not that something becomes an object of your perception; simply that you are conceptually equipped to make such a judgement. So how do I judge that time is passing? From clues to this? Does its passage not just register with me, as do the passing cars? So what does register with me? A succession of events, perhaps in the world, perhaps only in my thoughts; and the lapse of time is given with these, as a logically inescapable concomitant. It is given with them, and in this way, but I still may not be aware of it. That is right. A succession of events could fall within a creature's experience without the lapse of time registering, but that would be because it failed to draw the inference. In this sense, the step is not one that can be taken for granted, any more than seeing something which is *F* is seeing *that* it is *F*. Indeed, the character of the step as thus inferential fits in well with the difficulty of saying that an animal is aware of the passage of time, even though there is not the same difficulty in ascribing to it an awareness of events which succeed one another.

And psychological time? It is sometimes thought that time as measured by our clocks with such exactitude is a far cry from time as this enters into consciousness, where a period which is long in terms of the clock may be short in terms of our experience, or conversely. However, there are not two times. It is, rather, that time sometimes *seems* shorter or longer than it really is, where 'really is' means 'as determined by an accurate clock'. Not two forms or species of time, the physical and the mental or experienced, but two categories of item, the physical and the mental, which can be assigned an order and a duration.

Back to the grammar. Measuring speed, weight, length, duration, and so forth, is always measuring the speed, and the like, of something. You cannot have *just* speed. This dependence emerges in paraphrases giving a

predicational tie: measuring the speed of the train is measuring how fast the train is travelling. Similarly, measuring duration is measuring how long something lasts. Our account looks plausible when there *is* an event or process which we are timing: we find out how long it took the candle to burn down, the bath to empty. But suppose we clock the interval between two unconnected events. So we measure the time elapsed between two unrelated flashes of light, let us say, rather than the end points of an event, such as the wailing of a siren, or the end points of some concatenation of successive events, as with a series of pulsations of a body. Since there is then no event or process of which these events demarcate a phase, nothing of whose *duration* we might speak, it appears that it must be bare time that we are measuring. What otherwise is there to which a temporal measure may be applied if, on some occasion, the category of events and processes has nothing to offer? Well, if it does have nothing to offer, then, in a sense, we are not timing anything—no storm, no meal, no journey, no nap—but our clock is just idly ticking away. We are not timing anything; in particular, we are not timing time—two seconds, two minutes, or whatever. But, as premised, we are measuring the time elapsed between the flashes, the temporal interval which they bound, so is there not a sense in which bare time is being measured? This accords with the apparent 'objectual' status of terms such as 'interval' and 'period', which can be grouped alongside 'event' and 'change' in this respect. It is true that there is not here the clausal function apparent with such nouns as 'duration' and 'distance', but as long as, say, measuring a period of time reduces to measuring how long some event or events endure, we do not have to acknowledge time as an independent entity. When supposing ten minutes to have gone by we may not have in view a particular subject or subjects as having endured or lasted for ten minutes, but there surely has to be some event, or multiplicity of events, which bridges the termini of the period, a universe empty of such occupants being also empty of time itself. Or is that so? Is it so clear that, if nothing happens between two changes, it cannot be simply the time between them that we measure? True, if we make use of a clock it will not be the case that nothing happens, given the movement of the clock's hands, but might we not in some way calculate the time lapsed, or conjecture its magnitude, even in the absence of a clock, and would that not then give us pure time, time as a self-sufficient quantity? We shall return to this question.

8

Equality of Time Intervals

Our contention that the direction of time is simply the direction of change fits neatly into the relationist's programme of interpreting time in terms of change, and our discussion of the grammar of 'time' has also found in favour of the relationist. However, we have yet to examine the absolutist's challenge to give a satisfactory account of simultaneity and to justify talk of equal intervals of time without relying upon an objective criterion of equality at a level deeper than any that clocks can provide. In taking up this challenge we shall extend our discussion to more general issues relating to meaning, verification, and convention.

8.1 VERIFIABILITY

The central argument of the last chapter might be put in the following way. We begin with the contention that time is a quantity which clocks are introduced to measure. Is this correct? First, we have the point that it is only with the introduction of clocks that we have time in the relevant sense, but the more important consideration concerns the character of the particular specifications for which 'quantity' does duty. We misrepresent temporal measurement if we construe measuring a quantity on the analogy of, say, measuring a volume of liquid; if, however, 'quantity' is a stand-in for a clause, as with 'how long *x* takes', then this is indeed what clocks measure, but it is now not an independent substance or stuff, but, as the predicational character of the clause brings to light, a feature of some event or events that is measured. However, there are other routes to the rejected conception. In particular, the idea that an accurate clock is a clock that is true to the divisions objectively marked out in the flow of time, may appear inescapable. How, without such a standard, might we make sense of the possibility that even our most advanced clocks may be imperfect timekeepers? Merely to allow that one clock may keep better time than another would appear to commit

us to regarding the superior clock as a better approximation to the perfect timekeeper, where perfection is a matter of an accord with what the flow of time dictates.

Is this perhaps an occasion when the best is the enemy of the good? What we find are various ways of determining the truth of '*x* is more accurate than *y*' or '*x* is more reliable than *y*', but without having to trouble ourselves about making sense of, let alone finding, an *x* that constitutes the ideal of an unsurpassable timekeeper. So, if clocks of one kind generally agree closely among themselves, then they are to be rated as better than clocks of another kind which tend to diverge significantly from one another. Again, the physical construction of one type of clock may make it more or less likely than another clock to vary in ways relevant to inducing pertinent differences, as in speed or uniformity of movements of moving parts. Thus Isaac Barrow on the hourglass:

> because the Water or Sand contain'd in it remain entirely the same as to Quantity, Figure, and Force of descending, and the Vessel that contains them, as likewise the little Hole they run thro' don't undergo any Kind of Mutation, at least in a short Space of Time, and the State of the Air much the same; there is no Manner of Reason for us not to allow the Times of every running out of the Water or Sand to be equal.
>
> (Barrow 1670: 206)

Or again, constancies afforded by physical theory of a more general character may be cited, as when testing clocks against the laws of motion reveals one species of clock to be more accurate than another. Such findings do not require us to make implicit reference to the perfect clock, do not oblige us to grant that the comparison makes sense only against the background of such a presupposition. We distort these comparisons if we read such a requirement into them, as in this passage from John Lucas:

> So long as we are prepared to assess the time-keeping qualities of a clock, and are prepared in principle to replace it by a more regular one, if it could be obtained, we are committed to an ideal of absolute time which is not simply what the clocks actually say.
>
> (Lucas 1973: 91)

But we can make the basis of our comparison one of greater regularity or consistency without having to invoke an ideal of absolute time. Or, if, on the basis of its unfailing regularity and consistency, we should be drawn to speak of our system of timekeeping as perfect, this will have to be on the strength of such behaviour, not on the grounds of a supposed agreement with

some Platonic device which has *more* than virtues of this character. Indeed, to speak of the perfect clock as being completely or unfailingly accurate is misleading, in that accuracy suggests being true to some external standard. If the given clock is the best, as judged in terms of consistency, there is nothing against which it may be measured, nothing beyond it and its behaviour by which it might be judged. Compare the idea that space is curved relative to a higher space in which it is embedded, when we should surely wish curvature to be an intrinsic feature of space.

Note that conventionalism towards isochronicity—the view that it is senseless to ask whether two events are really equal in duration, that they can only be deemed to be so by fiat—appears to be offered in the belief that it is the only alternative to objectivism, to the view that perfect equality is an ideal that may hold in nature, even if we can never know this to be so (Newton-Smith 1980: 157). Conventionalism loses much of its appeal once it is allowed that *x*'s being better than *y* may be a recognizable state of affairs, and so not in need of being laid down by convention. You do not have to be able to proclaim that a given clock is an unfailingly accurate measure of time, whether by stipulation or by way of metaphysical conjecture.

However, it may be wondered whether, in seeking to make do with the comparative form, '*x* is a better timekeeper than *y*', we succeed in steering clear of the difficulties which a reliance on the intelligibility of 'The intervals t_i and t_j are equal' brings in tow. We find ourselves saying that the intervals marked out by *x* are more nearly equal than those marked out by *y*, but the qualification, 'more nearly', like 'roughly or approximately', does not lessen the dependence on an understanding of equality of time intervals. The problem is not the practical one of constructing a clock which will measure equal intervals; it is the conceptual one of knowing what it is to produce such intervals, just what the situation is, or would be, to which we are allegedly approximating. As suggested at the outset, a minimal interpretation of absolute time might require simply that there can be objectively equal units or intervals of time, that these notions are well defined. This may appear to be a somewhat trivial condition, but it does endorse a notion of the true time, and that in a way that would not find favour with relationists who would consider it to be in conflict with the apparent fact that we can do no better than fasten on certain regularities for reasons which fall short of a knowledge of their perfect equality.

It is tempting to formulate the problem in verificationist terms, to ask how we might know what it is for successive intervals to be equal if there is

no recognizable state of affairs in which we should be warranted in speaking of equality. This approach is seemingly reinforced by the apparent futility of seeking to clarify the notion by appealing to synonymous phrases—'Two intervals are equal if each is just as long as the other'. Is not showing how equality is *recognized* the only way we can break out of this impasse? But again, perhaps it is that the concept of equality, of being just as long, is not defined for the context with which we are concerned. So, in our primitive society we had a use for '*x* went on just as long as *y*' when the events being compared began together, but this did not of itself assure a use when one event took place today and the other was over and done with yesterday. In so far as it has not been laid down what is to count as equal in such circumstances, it is futile to offer synonyms. Being synonymous with 'equal', a phrase such as 'just as long as' will be subject to any failure of definition, any uncertainty in its application, which afflicts the former.

The general issue concerning verification is worth exploring further, a pertinent comparison being afforded by a consideration of grounds for rejecting absolute space. Leibniz famously rejected the suggestion that the whole universe might move: 'There is no motion, when there is no change that can be observed. And when there is no change that can be observed, there is no change at all' (Alexander 1956: 74). This is a typical and important example of the way in which verificationist considerations may be pressed into service. However, we may wonder. Is it that the conjectured change would be unobservable? Is it not, rather, a matter of a more fundamental defect, namely, that such change simply has not been *defined* with respect to this global state of affairs? Or, if you wish, that a definition of motion in conformity with accepted usage simply does not apply in the circumstances envisaged? That is, what we understand by 'motion' is 'change of position relative to another body', and this characterization is simply not satisfiable when predicated of the universe as a whole. 'A mile to the east' signifies a possible displacement *within* the universe, but not a possible displacement *of* the universe. To speak of a change that cannot be observed may be to speak of a change so minimal as to defeat our observational powers, when what is intended is surely something more radical: given the state of affairs contemplated, there simply is nothing *to* observe. The notion of movement cannot be accommodated to this circumstance, any more than 'the sound of one hand clapping' can describe anything we might hear. Any definition will be a matter of redefinition, a matter of movement in an extended sense of the term. To take a comparable 'hypothesis', it is not so much that a change in

the disposition of bodies whereby east became west would be 'indiscernible', as that it would be no change at all. The natural objection, seemingly less contentious than that urged by the positivist, is that we have been presented with a distinction without a difference. The words are meaningful—that is why we can give this diagnosis—but, for all that, one who uses them with respect to the totality of movable things can be said, in a very ordinary sense, to be talking nonsense.

The very ordinary sense I have in mind is one in which a patently false proposition, as 'Cats dislike fish' or 'A perpetual motion machine is physically possible' can be said to be nonsense. This is in contrast to the positivist's use, according to which a nonsensical utterance is totally unintelligible, not making enough sense even to be false; that is, we have nonsense as gibberish. This extreme use meets with a difficulty when unverifiability is advanced as the grounds for a condemnation as nonsense, since it would appear that some understanding of the words is required, an understanding which character as gibberish precludes, if we are to conclude that verification is ruled out in their regard. How can we even set about considering whether a proposition is capable of verification if we have not the remotest idea of what is being put forward? It is of course true that a string of nonsense words, as 'Tic tac toc', could be said to be unverifiable, but the string is not nonsense *because* unverifiable.

A similar issue to that concerning motion is raised by the supposition that everything in the universe is expanding uniformly, a supposition which has often been rejected as empty on the grounds that it is not susceptible of empirical confirmation or refutation. On our approach, there is a prior question: is expansion defined for the case in question, when *everything*, bodies and the spaces between them, is subject to the expansion? Just as motion of a body demands another body or bodies relative to which the former moves, so a similar point of reference is required for expansion. There must be something relative to which other objects can be described as increasing in size, something which remains constant. However, let us suppose that an increase in size brings with it greater fragility on the part of the expanded bodies. Since this change could be tested for, do we not have after all a genuine empirical hypothesis? It will be recalled that Ayer came around to the view that a hypothesis was meaningful so long as it had testable consequences (1952: 11). Conclusive verification was deemed an unrealistic demand, unsatisfied by many scientific propositions which we should not wish to relinquish, universal generalizations being notable examples.

The main difficulty, however, persists. If motion and expansion are relational in the way I have maintained, in the situations envisaged we shall continue to be denied one term of the relation, so the conditions requisite for applying the concept will continue to be unsatisfied. The gap in definition is in no way filled by alleging that the hypothesis has certain observable consequences; we are no wiser as to *what* these are consequences of. So am I reverting to the demand for conclusive verification, a demand which has been quite generally abandoned, seemingly for persuasive reasons? Natural though it is to see the issue in this way, it is, on the present account, a mistake. The demand remains one for definition, for knowing how the hypothesis is to be taken in circumstances in which the customary explanation of its meaning does not apply, and a satisfactory formulation of the hypothesis will do no more than elaborate its truth conditions. It is true that the use sought for a hypothesis may require that it be possible to tell when its assertion is warranted, but that is not a condition which, in general, should find its way into an account of the word's meaning. Priority remains with the matter of definition: if this is wanting, there is as yet nothing *to* find out.

An issue which invites the same account is that of Newton's globes (1999: 414). Suppose we have two globes linked by a cord. If they are revolved around their common centre of gravity, a tension is set up in the cord, a tension which varies in proportion to the speed of the rotation. Suppose, now, that the globes plus cord are all that the universe contains. This leaves us with nothing detectable relative to which the globes are in motion, but if there is still the tension in the cord, it surely retains its standing as a basis for ascribing rotational movement. There would be further testimony to such movement if, supposing the cord to snap, the bodies were to fly apart.

Newton thought that rotational motion had to be granted in this case and, since by hypothesis there are no other bodies relative to which the globes are moving, the fixed points had to be furnished by space itself. Suppose, however, we consider that space has no points, fixed or otherwise, to offer, that there can be points *in* space, definable in terms of its occupants, but not points *of* space. Is it possible to hold that rotational movement may still take place if globes and cord behave in the way envisaged? If we deny rotation, we have, of course, to grant that the tension in the cord and the recession of the globes cannot be explained by appeal to their rotation, and it may be far from clear what form an alternative explanation might take—understandably: we have described a situation prima facie at odds with anything that could take place in the universe as presently arranged, so the lack of an explanation is

only to be expected, and in no sense an objection to our position. However, the point of importance is that tension in the cord, or the bodies flying apart on the cord's being severed, is not what we *mean* when we say that the globes are in motion, but a lacuna remains at this point which it takes more than an *empirical* relation—as provided by an indirect ground—to fill. To treat the tension in the cord as evidence for motion presupposes that we can make sense of such a change; it does not confer a sense on that hypothesis. If conditions required for us to make sense of motion are not satisfied, then whatever the evidence is evidence for, it is not motion. Again, a point about definition rather than knowability.

The same point holds in response to the suggestion that people in a space-craft could tell that they had accelerated from the experience of inertial forces, that we may always speak of motion when there are such forces, and do not have additionally to assume the existence of other bodies relative to which the given body is in motion. Once more, in specifying what, precisely, the evidence is evidence for, we are obliged to specify circumstances in which another body or bodies figure. We shall take this up again in Chapter 10. In all these cases we may say it is meaningless to speak of motion, but my suggestion throughout is that that is to be explained as first indicated; not a matter of gibberish so much as a misuse of an intelligible form of words. We are not being stubbornly verificationist, but meaninglessness comes *first*, rather than having its basis in undetectability. It is of interest that the lack of definition suffered by the various hypotheses is, at least as far as the present argument is concerned, more damaging than is unverifiability. It is also of interest that remedying this lack requires us to give an account of meaning which, while not couched in terms of conclusive verification, goes beyond what merely inductive indications could provide: whether verifiable or not, the conditions specified give conclusive grounds for the hypotheses in question. We are expanding the area in which the question of verifiability can be raised. Note that when speaking of 'lack of definition', all that is meant is that it is not clear how, if at all, a word applies, how it is to be used, in certain contexts. The complaint is in general not that a verbal definition is lacking, though with technical language this could be an appropriate demand.

However, despite these arguments, it is possible to embrace a compromise position, a position which has been anticipated in our discussions of spectrum inversion and object identity. Strictly speaking we do not have enough to justify talk of rotation with respect to the globes, let alone find ourselves obliged to accept this description. However, to say that the globes are

rotating does not give rise to unwanted empirical consequences, and it may have advantages with respect to the way our generalizations and laws are formulated. The tension in the cord is not, on this account, *evidence* for rotation, but it would be a finding which made it reasonable to introduce the concept even though conditions for its application have not been met. This would mean that 'rotation' had undergone a change in or extension of its meaning, but the advantages of this verbal manoeuvre might make this acceptable. Certainly, a shift in meaning is preferable to the introduction of a metaphysical conception of rotation which undetectability may be thought to invite.

Our concern is to consider what response other than the positivist's is appropriate when we are presented with a non-logical hypothesis which cannot be settled by experience. A more fanciful, and blatantly metaphysical example, is that of reincarnation, a topic which, we shall see, is not so remote from our main concerns as might appear. Vast numbers of people firmly believe that in an earlier life a human being may have been a fly, a toad, a centipede, or any other living creature. This belief could be dismissed on scientific grounds if it required physical continuity between that being and some deceased insect or animal, but if it makes no claim to such continuity, then, while this may help protect it from a biological refutation, it leaves us with nothing to appeal to which might give sense to the alleged identity. We are left not so much with bad science as with a totally vacuous 'hypothesis', one which would not be advanced one jot even if we encountered behaviour usually to be found only in non-human animals. Such behaviour might pose an explanatory problem, but would contribute nothing to understanding the claim that the person just *was* an erstwhile centipede. It is not so much a question of a lack of evidence, but of a failure to make clear and coherent what any evidence might be evidence *for*.

It seems plain nonsense to hold that a human being was once an insect, say, but suppose someone is held to be a reincarnation of a deceased human being—a so-called 'rebirth'. There are, after all, anecdotes about people with memories which do not relate to their current world but which appear to be true to events which someone else had in an earlier time and place. The supposition of an identity with a defunct mortal does not attribute totally foreign features, as those of an insect, to a human being, so is at least coherent on this score, but the difficulty of relating the present individual to someone now dead persists. Suppose it is insisted that this individual is none the less the same as the earlier person. There is no problem in speaking of distinct

individuals as being the same in some respect or respects, as in strength, moods, intelligence, and so forth, but in this instance the sameness is to imply that the present person was the subject of experiences which took place before he was born. Is this once more a case where we can say, that, for all that, the present person can be reckoned the same human being as the earlier? Two twins may be the same in numerous respects, but they will not be the same person. However, in the present case, one obstacle to identity of persons will not arise: their existence at different times ensures that we do not have one of them here and at the same time the other elsewhere, a circumstance which of course entails their distinctness. However, if we should speak of 'the same person', this would not represent a discovery, physical or metaphysical; it is simply a decision to extend a certain way of speaking. This would not be enough to satisfy someone who believed in reincarnation, which presumably requires more than a *decision* to make it true. There has to be something somehow communicated from earlier to later person; and since, by hypothesis, nothing physical, it has to be something immaterial. But if we can make no sense of such transference, and if holding that the present person was alive at an earlier time has no refutable consequences, how could it be inadequate? We have as yet to be told of an intelligible possibility that is overlooked in this account.

It is worth stressing that the rejection of reincarnation as a metaphysical hypothesis is not based primarily on biological or other scientific grounds, a point which is often of relevance in debates which would regard as fundamental the opposition between science on the one hand, and religion or theism on the other. An appeal to scientific considerations is in place when, for instance, it is a matter of combating a superstition—the postulation of an other-worldly cause where a naturalistic explanation can be expected, as when such natural disasters as plagues, storms, and volcanic eruptions are interpreted as acts of a vengeful God. Or again, when efficacy is claimed for incantations or rituals, or reliability claimed for omens. But whether we have in mind religion or theism, it is not always science that we should turn to for a relevant alternative, the more pertinent objections being as often philosophical as scientific, even if considerations of both kinds have a place. With *what* science or sciences do belief in purgatory and limbo, mankind's culpability due to original sin, or the doctrine of the trinity conflict?

Some scientists appear to think that philosophy has little to offer with respect to problems which, as in the philosophy of mind or the philosophy

of science, lie in the overlap between the two disciplines, but one of the major contributions of philosophy is to draw attention to the *kind* of issue at stake. Not every problem is to be resolved by empirical evidence or its lack, but the issue may be purely conceptual. Atheist scientists sometimes maintain that the existence of God is a hypothesis having no more than a small probability of truth, but standing as a *hypothesis* is not to be lightly conceded if we have no idea what it would be for 'God exists' to be true. Assigning only a low probability is not an appropriate response when what is in question is intelligibility. Again, it is claimed that the proposition cannot be refuted, since 'you cannot prove a negative'. That may be so with respect to some empirical propositions, but the appropriate refutation in this instance is conceptual: acting on or in the world involves physical contact with it or its occupants, and we do not know how this could be realized when the agent is an other-worldly being; or, more commonly, various of the divine attributes, as infinite power, knowledge, and goodness, appear not to be mutually consistent—let alone identical with one another (see Rundle 2004: 192–3, ch. 1). Sadly, philosophers themselves sometimes fail to do justice to the value and distinctiveness of their subject, being reluctant to recognize a distinction between the conceptual and the empirical on the grounds that the distinction is not always sharply defined. But there are cases where the distinction is apparent, important, and central to an understanding of how the relevant issue is to be settled.

Finally, a number of points may be usefully drawn together. To denounce a proposition as meaningless on the basis of its unverifiability appears self-destructive, given that some grasp of what is asserted is required to appreciate its character as unverifiable. In a universe of only one body, it is not that you cannot *tell* whether the body is in motion or at rest, that the two states are empirically indistinguishable. In such a universe, nothing would count as motion. Nor, for the same reason, can we even say: suppose the body is in motion. And the same holds for postulation. We are not in a position to postulate something—absolute space, reincarnation—if we do not have some understanding of what we are postulating. But while we cannot say, 'Suppose you are the reincarnation of a bee', we can say, 'Suppose we had a use for the words "the reincarnation of a bee" '. This sounds lame—any words could have any use imposed upon them—but we can seek out readings which stay close to the original but replace nonsense by sense. Indeed, this move opens up a number of possibilities of interest, both with these examples and elsewhere.

8.2 SIMULTANEITY

How do matters stand with respect to Einstein's account of simultaneity, relative to a given inertial frame, an account which was advanced by Einstein as verificationist? I have suggested that our basic idea of simultaneity is not so much that of two events happening at the same time, as given by a clock, as that of two events happening together, where this may be explained in terms of events observed, as someone bowing while others are clapping, or smoke billowing as flames burn. The metrical conception is a particular case of such simultaneity, where one of the events to be matched to others will be a clock reading. This latter, however, is the more relevant case in the present connection. When, as with events taking place at a distance, it is not a matter of what the present scene offers to perception, we should none the less wish to align it with this case, to argue that, despite the distance, we can treat the far-off event as if it were an occupant of an enlarged perceptual field in which it is observed in the company of nearby happenings. Einstein gives us an account of distant simultaneity which is at least consistent with the notion as applied closer to home, but which involves a degree of stipulation which has been the source of controversy. It is an account which allows us to *extend* the concept of simultaneity to events which cannot be judged simultaneous in the more straightforward way possible for events near at hand. Once more a problem of definition has been addressed and resolved, and the resolution does not have to proceed from premises which lay down that simultaneity must be a verifiable relation, welcome though this may be as a consequence of the extension.

The concept of simultaneity is central to the special theory of relativity, and it is worth pressing on further with our exploration. The first point of importance has already been touched upon: there is a genuine question as to how 'simultaneous' is to be understood in application to far-off as well as to nearby events. It is not that, with respect to distant events, it may be true that they are simultaneous with what is happening here now, it may be false; we simply cannot tell which. It is true that we cannot tell, but that is because we have not said what it would mean in this instance, and when that is the reason there is as yet no question of truth or falsity.

Can we not say with W. L. Craig, 'What we mean intuitively by simultaneity is "the property of occurring at the same moment of time" '? (2001b: 163). We might hesitate to agree, given the preferability of a more basic

non-metrical definition, but the problem which concerns us would arise even with an analysis of the preferred form, as 'What we mean intuitively by "simultaneous" is "occurring together" '. In either case the objection might be that we have simply come up with a phrase that repeats the problem, any difficulties we might have had with 'simultaneous' recurring with 'occur together'. But that cannot be a valid objection, since it will defeat any correct analysis of meaning. So is it really meaning that we are in search of? If there is a difficulty, it must be because events near at hand are judged simultaneous if such and such is true of them, where such and such is a condition whose satisfiability is not so readily apparent when a large distance separates the events. We shall have to overcome the difficulty which this imposes in such a way that we bring distant events under the same characterization as those nearby. Somehow, the fact of being distant has to be cancelled, has to be shown not to introduce an essential difference between the two cases. So, we are dealing with a question of meaning, but one in which the explanation of meaning will not be satisfied by provision of just any synonymous word or phrase.

Einstein is saying that there is no compelling analysis of this kind; we can speak of simultaneity with respect to distant events, but this involves an extension of our concept. Craig takes this to show that the time concept in the special theory of relativity [SR] 'is predicated upon a definition of simultaneity which we are under no obligation to adopt'. He continues:

> Contrary to the widespread, popular impression that Einstein proved the relativity of simultaneity, in fact all SR does, as should be evident from our exposition, is *redefine* simultaneity. The operational definitions Einstein gives to define simultaneity, and, hence, time, are completely arbitrary for someone who has not yet accepted the theory. . . .Why should we regard two separated events as simultaneous, just because a light signal is inferred to reach the reflection event at the time of an event midway between the signal's emission and reception? Why is this what we mean by 'simultaneity?'
>
> (Craig 2001b: 162)

It is not in the least arbitrary to stipulate that the time it takes a light signal to go from *A* to *B* is the same as the time it takes for such a signal to go from *B* to *A*. Far less arbitrary than Craig's claim:

> One could have used bullets instead of light signals to synchronize distant clocks. One could with equal justification (or lack thereof) have defined simultaneity by an exchange of signals in which the outbound signal is a light beam and the return

signal is sound waves. For in the absence of any absolute time we do not know how distant simultaneity is to be defined.

(Craig 2001b: 163)

This truly is an instance of the best being the enemy of the good. However, we may agree with Craig that Einstein's definition is not one that we are obliged to accept. Indeed, it *has* to be that way if it is correct to say that our use of 'simultaneous' with respect to our immediate surroundings does not dictate how the description should be used with respect to distant events. The absolutist believes that it does, but this is not shown simply by saying, with Craig, 'What we mean intuitively by simultaneity is "the property of occurring at the same moment of time"'. All parties can agree to this, but such agreement does not help resolve the issue. The difficulty raised by the need to bring the two modes of simultaneity under a common heading is not lessened by an appeal to absolute time, which has nothing to say about how a rapprochement between the two cases may be effected. The allegation of arbitrariness constitutes an objection only if some non-arbitrary means of determining simultaneity is being ignored. If it is not, if it is not prescribed how we are to understand 'simultaneous' in the problematic contexts, there is a sense in which any stipulation, being uncompelled, will be arbitrary, though, as with our observations on equality of time intervals, the arbitrariness does not extend to an all-out rejection of '*x* is better than *y*' in this context. It should also be mentioned that alternatives to the convention which Einstein adopts have been held to conflict with other claims enjoying strong empirical support (Malament 1977).

A point of some interest is the following. Einstein specifies a procedure whereby 'simultaneous' can be extended beyond its more familiar domain of application, but, as just noted, we do not have to make this extension. Even if, as has been argued, relativity theory does not leave the notion of simultaneity as underdetermined as Einstein thought, we might simply rest with the admission that, without some redefinition, its applicability is circumscribed, and be content to leave it at that. We are, we might say, happy to rest content with the temporal concepts we have in the domain which most concerns us, that of proper or local time. Then there would be no question of a revision of our concepts which comes with acceptance of the special theory. There would, for instance, be no question of allowing that space-time was somehow more fundamental than our ordinary conception

of three dimensions of space plus one of time. Moreover, even if we do make the extension, there would appear to be a sufficient degree of independence between the old and the new concepts for there to be no challenge to our ordinary scheme from theories which rest upon the new. That is particularly clear when we move from time to the very different concept of space-time.

Introducing the notion of space-time, Minkowski famously observed: 'Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality' (1964: 297). This may appear to cast doubt on the reality of space and time, but it is the *independent* reality of the two that is in question. It is not as if time or space had somehow been done away with, more that an unexpected relation has been forged between them, namely, specifications of time and space (better: place) are seen to be interdependent; that is, time is time *where*, and place is place *when*.

The issue can be elaborated in a way that brings some comfort to those who, like me, are not well versed in science. Take the fundamental physical quantities of mass, length, and time. The equations in which values for these quantities figure may differ greatly in relativistic as opposed to Newtonian physics, but that consideration alone does not mean that our understanding of 'length', say, will have to change as we move from the one system to the other, however different the length of a body is taken to be on each theory in certain circumstances. However different *numerically*, that is. We could still offer, both ostensively and verbally, the same explanations of *length* whichever system is envisaged. It is, after all, length as ordinarily understood that is required by relativity theory to contract in the direction of motion. This stance is supported by the consideration that equations characteristic of the different systems reveal functional relationships between various quantities rather than define the concepts involved. So, Einstein's equation, $e = mc^2$, tells us how energy values are calculable from those for mass and the speed of light; it does not tell us that energy is a capacity for work, as our verbal definition might. There is, accordingly, a strong presumption that an account of our temporal concepts that is true to what we have learned in mastering the relevant part of the language should not be vulnerable to objections based on unexpected results of calculations made with respect to unfamiliar circumstances—though, if the same concepts are involved with respect to the familiar and the unfamiliar, such accounts must, of course, leave room for the latter.

8.3 EQUALITY AND CONVENTION

To return now to our original issue, if our concern is with definition, may we not have to admit after all that the problem of the equality of time intervals is to be solved by proposing that the equality is one that is to be secured by a convention? This may appear to be the only alternative, but since we are required to respect the conceptual connections which equality will have with other terms in the language, this move may be more complex than it looks. Whitehead objected that if it is just a matter of *calling* times equal, we cannot explain the identity of colours of light emitted by molecules of the same type, as being due to vibrations in equal periods (1923: 39). This objection has at least to be addressed. For some, a more thoroughgoing dissociation from this whole way of speaking is called for, as with Poincaré: 'there is not one way of measuring time more true than another; that which is generally adopted is only more *convenient*. Of two watches, we have no right to say that the one goes true, the other wrong; we can only say that it is advantageous to conform to the indications of the first' (1913: §5; see Ben-Menahem (2001) for a detailed account of Poincaré's views).

If our earlier discussion is accepted, there need be nothing to fear in an appeal to convention, but at this stage the conventionalist response would be premature, and there is more than one alternative to investigate. Time being a function of distance and velocity, it is natural to turn to these concepts to find a test for equality of time intervals, and a solution of some simplicity, if of no great practicality, appears to be yielded by Newton's First Law of Motion, which states that every body remains in a state of rest or of uniform motion in a straight line unless acted upon by a net force. It follows from this Law that equal intervals of time are those in which a body not subject to forces moves equal distances, but a problem arises when we consider how relevant forces are recognized as operating: can we tell of their influence independently of noting divergences from uniform motion? If such divergences become a criterion for the operation of a force, then whether or not there is such a force is determined by whether or not a body moves equal distances in equal times, so the Law cannot be used to establish such an equality. We might try to meet this objection by arguing that we can find that a force is operating without making use of this criterion; we do, after all, have a body of knowledge concerning what forces are relevant to modifying movement, and how to correct for their influence. True, findings here may have to be

provisional, but we should appear to be demanding an unreasonably high degree of certainty if we regard the possibility of gaps in our knowledge of causes as prohibiting us from adopting this solution. Again, we can imagine a world in which, when a force was applied to a body, that body moved about in a random, unpredictable manner, in violation of the Law. The Law is special, is distinguished from other empirical propositions, not in being definitionally true, but in laying down a condition for the intelligibility of behaviour under a force.

While a case can be made for defining equal intervals in this way, given the importance of the issue, it is of interest to see whether any alternatives can be devised. Hans Reichenbach saw the problem in the following terms: 'There is basically no means to compare two successive periods of a clock, just as there is no means to compare two measuring rods when one lies behind the other. We cannot carry back the later time interval and place it next to the earlier one' (1957: 116). So, it cannot be said that two time intervals are equal if, had they occurred together, they would have been found to be congruent. Displacing intervals in time does not appear to be meaningful even in the imagination, let alone in reality. However, perhaps the same incoherence does not threaten when we turn to the event pairs which define the intervals. We wish to compare t_i, the interval separating events A and B, with t_j, the interval separating a later pair of events C and D, and we claim that we have equality supposing that, had A and C coincided temporally, so too would B and D. However, this counterfactual, too, might be considered questionable on the grounds that the events envisaged as occurring at different times would then have been different events. It has to be granted that events may be individuated in a way that makes this true, but it is enough that we can have equality of intervals under an identification of events that makes lesser demands, and this too appears possible. So, we have two events, A and C, and with respect to a suitably liberal criterion of identity, we can contemplate the same event, A, being delayed until the moment at which C occurred. But now, in relaxing our criterion of identity in this way, we are no longer focussing on just that unique event pair originally given, but we are talking about any event pairs satisfying certain general conditions. So, go back to Barrow's hourglass. Let us suppose we have two such glasses, x and y, and that we find that, when the two start measuring off an interval together, they terminate together. Suppose now that we have x and y measure off intervals successively. It is surely an intelligible and indeed highly reasonable counterfactual claim to say that had the flow of sand through x been delayed

so that it started when *y* started, the two would have terminated together. We allow that the same event, suitably specified, could have had its starting time brought forward or back, and this allows us to make sense of the *successive* happenings as marking out equal intervals of time. So, for instance, our specification of the event might be given with 'the tenth use of *x* to measure an interval', and that event, while it in fact occurred at noon, let us say, could have occurred earlier or later. We have, of course, to address the question whether, with a different starting point, there would have been any change in conditions affecting the flow of the sand, and so forth, but all the evidence may point to a negative answer.

The issue is in principle no less problematic than the following. Suppose that, on dropping two differently shaped objects of the same weight from the same height, we find that they reach the ground together. This behaviour would support the claim that, had we delayed the drop of one of them until after the other had been released, the latter would have taken the same time as the former to reach the ground. Provided, of course, that nothing in the relevant circumstances had changed; but that could be a proviso with everything in its favour.

How do we find out what factors might interfere with the length of the period in some periodic process? We attend to synchronous instances of that process and compare the outcomes when one instance has been influenced by a putative disruptive factor. So, we have our two clocks, as like, physically, as we can make them, and we ascertain whether a circumstance peculiar to one—grit in the mechanism, immersion in water, proximity to a magnet—results in a reading different from that of the clock not subjected to such influences. If, now, the factors which have been found to introduce a discrepancy are no different with respect to *AB* and *CD*, events which mark out ostensibly equal periods of time with our clock, then we are entitled to regard those periods as equal. Such treatment may, it is true, have to be regarded as only provisional. There may be factors other than those investigated capable of introducing variations. The main point is that such factors, recognizable in the way indicated, are all that need be taken into account. There is not a remaining question how the periods of time would have been had they been directly compared, a question having an answer which would finally put the matter to rest where what we are envisaging is only second best. To repeat, instants of time cannot be imagined displaced or relocated, but events in time can, and it is by reference to events that temporal intervals are defined.

How is this conclusion to be interpreted? The contention that equality and inequality of temporal intervals is something which can in principle be discovered may be taken by some to support the absolutist, by others the relationist. Mackie, for instance, takes it to confirm absolutism:

> Once it is admitted that there are absolute relations of equality or inequality of time intervals, it is an easy further step to the conclusion that these absolute relations are themselves to be explained by the hypothesis that each interval on its own has an intrinsic metrical feature that we call 'time-length' or 'duration', something that, as we may put it, interacts with the intrinsic features of each clock to determine just what performances it will go through in that interval. In other words, we can regard as well confirmed also the absolutist view on [*duration/interval* in time].
>
> (Mackie 1983: 13)

It is difficult to see how duration could *interact* with the intrinsic features of each clock, or indeed with anything, but, more importantly, since we stay within the domain of changes in arriving at a judgement of equality or inequality, we are not going beyond the resources to which the relationist considers us to be confined, and this appears to be the prime consideration in determining which party has right on its side, any appeal to absolute time being superfluous.

Let us return to the question whether, in the absence of a system of timekeeping, it makes sense to affirm or deny that an event went on for just as long as one that succeeded it. What answer can we now offer? By using an hourglass, or comparable device, it might be concluded that, had the two events begun together, one would have outlasted the other. In using the device in this way, are we treating it as a timekeeper? In one clear sense, No. An hourglass can be said to provide a measure without going beyond the broad terms which the non-metrical conception recognizes. It can be used to determine *going on just as long as* or *longer than*, but it may not measure out numerically quantified periods of time, as with a clock, let alone define points or instants of time. Use of such a device can, then, be invoked in making sense of comparisons of successive events in terms of duration prior to the advent of clocks. And, indeed, as noted at the outset, there is still the possibility of temporal comparisons in favourable contexts even without any such device. Thus, our confidence that some happening may be of longer duration than another—not contained within it—may rest on the grounds that the latter could be repeated more than once within the space of the former. Note, too, that the relevant interpretation of 'the same event' can apply not only with

respect to counterfactual situations, as when we look back to the supposedly longer happening and consider what would have happened if such repetition had been contrived, but we may also look to future situations which may put a matching hypothesis to the test: repeat the longer happening and you will find that more than one occurrence of the shorter can be made to fall within it.

There are all manner of clocks, involving different physical principles—pendulum, water, atomic, sapphire crystal, for instance. Suppose that we have two varieties, each of which behaves impeccably in its own terms, clocks within a given type agreeing consistently with one another over a range of testing conditions. However, suppose, too, that a discrepancy is detected between the two types. This may be only slight, but over the years the time as recorded by one type of clock may diverge significantly from that recorded by the other. What should we say? That there are two times, perhaps? This is the possibility which E. A. Milne allowed with respect to atomic and astronomical clocks respectively in his kinematic relativity theory (1948). Does it make sense? On the one hand, neither system of timekeeping can, we shall assume, be faulted in terms of its internal consistency. For neither is there any external standard of proven superiority, any standard which would allow us to say that the relevant clocks are running fast or slow. Ultimately, the only test for unerring timekeeping must be internal: any variety of clock which emerges as superior to its rivals scores better in terms of virtues associated with self-consistency—this is the force of our preceding observations—and each clock meets this test with flying colours. Given that for each system there is nothing more that one could ask for in this respect, it seems that we could be obliged to accept that there are two times. On the other hand, the very idea that there should be more than one time appears dubious. It is not like the case where, as with Greenwich Mean Time and British Summer Time, we have differences of a merely notational character. Our envisaged times cannot be reconciled in this way. Suppose that x endures between t_1 and t_n. To the question, for how long, there is surely only one answer. And yet, we know from the special theory of relativity that the time between two events can differ in different reference frames. Would it be any more of a shock to our intuitions to learn that within a single frame the answer was not necessarily unique?

There are two cases to consider. First, it may be that a description favoured by the evidence implies that a unit of A time is some fraction of a unit of

B time. So, let us suppose that it is not possible to detect any discrepancy between one *A* second and one *B* second, but that over a long period of time it emerges that when *n* seconds have registered on our *A* clock, $n + 1$ *B* seconds have elapsed, in which case it is a possible hypothesis that individual units differ systematically in accordance with this formula. The other possibility is that the discrepancies are not regular, but that individual units are occasionally found to differ. So, for the most part, *A* seconds and *B* seconds agree, but occasionally they are discrepant. What do these possibilities spell for the question of two times? The first possibility is the more straightforward, in that we at least have two thoroughly consistent temporal measures, but by the same token we also have good grounds for concluding that we are simply dealing with different units of time: one *A* second is not interchangeable with one *B* second, but that simply means that 'one second' does not have the same meaning in the two systems. It may be held that in the second case, the conclusion to draw is that at least one of the systems of timekeeping is not entirely accurate. We may not be able to tell which, but whether or not we can, it is surely a matter of a failing in this respect, rather than that we have to do with two different times—except in the unwanted sense of having one timekeeper that is possibly right, and one that is definitely wrong. But what do 'right' and 'wrong' mean in this context? We argued that recourse to conventionalism was not necessary to secure equality of time intervals, but here a conventionalist resolution appears inescapable, in that it is surely only once we have opted for one of the clocks as defining our standard that we have a basis for any such distinction. In both cases, all we have to go on are inter-clock comparisons; not some ideal Platonic arbiter which might provide the definitive standard.

We have defended the view that the rate at which time passes is a coherent notion. Can we also add that, when time is said to pass more slowly in another reference frame, that is just a matter of changes taking place more slowly? Not, of course, relative to time in that frame, but relative to time in ours. It is nonsense to speak of time as passing slowly as measured by another time in the same frame. If *all* change is affected by the stretching envisaged, then, in the frame where this is so, there is no clock which marks out longer periods between changes than it had previously.

Time can pass at different rates if all processes in one frame slow down relative to measurements made in the other. This observation is of interest by way of being, perhaps, unexpected, not by way of being disturbing. It brings time—and velocity—into line with other physically based phenomena, as

colour and weight, which are also to be regarded as relational. So, while our ordinary experience does not lead us to relativize weight, we know that our judgements of weight would be different on the moon from what they are on earth. Where there may be a difference is on the question of a privileged position. So, with colour the optimal position for making judgements of colour is one where we can best discriminate among shades, the privileged position being shown by our use of such phrases as 'really is blue' in that position, and 'only looks blue' in other conditions. Just as 'really is . . .' can be justified, so can concomitant talk of objectivity. What would be an error is to think of objectivity in terms of a standpoint which does not figure in our practice or our understanding—a standpoint available only to God.

If we wish to avoid the offending idiom, we may say 'A shorter period of time has elapsed' rather than 'Time has passed more slowly'. Compare talk of a reversal of time as an ill-chosen way of alluding to the possibility that the order of events in time might be reversed. However, it should be acknowledged how large a concession we have made even in allowing that the former way of speaking may be in place when time in different frames can be compared in the way indicated. I suggested above that the grammar of 'time' is misconstrued if the measurement of time is understood as analogous to counting objects of a given kind, as apples, rather than as analogous to counting the *number* of apples. However, I also acknowledged that counting the number of *x*'s *could* be a matter of counting 'objects', as when you count the prime numbers less than 100. What we are now presented with is a similar exception with time. Measuring the time taken is not normally a matter of measuring hours, minutes, or other temporal units to find out *their* length, but it is precisely this when we evaluate in terms of our own time the time elapsed between two events as measured in another frame. What we cannot accept is a time detached from all motion or change, in such a way that all change could be found to have uniformly speeded up or retarded as measured against this constant, as with Newton's absolute time, flowing uniformly 'without relation to anything external', and where 'All motions can be accelerated and retarded, but the flow of absolute time cannot be changed' (1999: 408, 410); or that it might be a matter of slowing down time in a way that was not simply a matter of slowing down motion. I mentioned above that views of time considered wrong-headed could often in some sense be correct. The main point on which we have not made any such concession would appear to be this: there is not some self-subsistent quantity, time, there with its own perfectly equal divisions, against which,

ideally, we might measure our clocks for accuracy; nor is there any need for such a conception in order to make sense of equal intervals of time. Add to this our analysis of temporal precedence in terms of change, and it would appear that the case for a relational account continues to outweigh the case for the absolutist.

9

Temporal Asymmetries

In terms of their reality, there is nothing to choose between past and future. It is not, for instance, that the past is real, the future not; the past *was* real, the future *will be*. Being equally non-present, the two are to that extent on a par. True, we say that the past lives on in our records, memories, and innumerable traces of earlier happenings, and in this way contrasts with the largely unknown future. Could we, then, not have a notion of being real detached from that of present existence and based on the consideration that we can be in touch with the past through memory in a way that is not possible with respect to the future? This would, I suggest, be a matter of stipulation, but a stipulation resting on an uncontested contrast between past and future, and so long as we bear in mind that nothing more is implied by the applicability of 'is real', so understood, than is warranted by the grounds for its introduction, there is little to which we might object. The stipulation might strain current usage, but that is all. As ever, it is when the stipulation is couched in terms which are flatly at odds with our ordinary understanding that we have grounds for complaint. Broad, for instance, wrote: 'Nothing has happened to the present by becoming past except that fresh slices of existence have been added to the total history of the world. The past is thus as real as the present' (1923: 66). Whether or not we continue to question '*is* real', we should certainly balk at the inference which he draws: 'There is no such thing as *ceasing* to exist; what has become exists henceforth for ever. When we say that something has ceased to *exist* we only mean that it has ceased to be *present*' (ibid., 69).

9.1 TIME AND INFINITY

One area where it is difficult but important to maintain a symmetry between past and future concerns the temporal extension of the universe. Could the universe have been in existence for an infinite time? Could it go on existing

for ever, or is it finite in one or both directions? The question of a future infinity appears to be the more tractable, in that we can readily elucidate what it is to go on for ever, if, as it surely must be, this is taken to be a matter of a potential infinite. So, whereas it would seem possible that the universe should continue in existence for a finite time only, the claim that it might go on for an infinite time from the present is not a claim that could prove true; there is no point of future time at which one could say: it has turned out as predicted. But while there cannot be a time when, starting from the present, the universe will have existed for an infinity of years, this does not debar us from saying that it could go on for an indefinitely long period of time, that it could continue in existence for the foreseeable future, even that it could go on for ever; this need mean only that we can set no limits to its future duration. So, it could be that, whatever year you specify in the universe's future, it will continue to exist in the succeeding year. The only future dates on which one can have a perspective on the universe are at a finite remove from the present, and while there are infinitely many of these to choose from, that is not to say that infinitely many such points of time could, let alone will, come to pass. The phrase 'potential infinite' is, we may note, a misnomer, in so far as it suggests that such an infinite could be on the way to becoming actual.

But, surely, it can be true that the universe will be in existence in any year you care to specify only if it will be in existence in each of infinitely many years yet to come. *Any* implies *without exception*, presuming the reality of *every*. No. To repeat, the universe will never have been in existence for more than a finite time from the present, even though there is an unlimited number of finite periods from which we may select to measure its age. The age of the universe is always a matter of its age *at some time*; perhaps its age at the end of time, but that end can be no more than finitely distant from the present.

This argument appears to be challenged in Dretske (1965: 99–101). Someone announces that he is going to count all the natural numbers. So, Dretske maintains, if the person never stops counting, then he will count to infinity, in the sense that he will count each and every one of the finite numbers—an infinite class. However, it is still not clear what 'counting to infinity' means. The person will, we may suppose, keep on counting indefinitely, be counting at any point of time you care to choose, but he will never have counted an infinity of numbers. His counting *ad infinitum* is always work in progress. Dretske acknowledges that the person never *will have* counted to infinity, but he takes this to show no more than that '*S* will

do *X*' does not imply that at some later time it will be true to say '*S* has done *X*'. But if you cannot draw this inference, can you say that *S* will count *all* the natural numbers? You cannot set an upper limit to the numbers *S* may reach, but he will never count or have counted more than a finite number of natural numbers, so in what other sense can it be said that he will count them all? '*S* can count *any* number' invites us to specify an arbitrary number, as large as we wish, up to which *S* may count. That may be all that is intended by 'S can count *all* the numbers'; otherwise, we appear to be left with a reading on which 'counting all the numbers' signifies a completable task. What a person might count is never more than what a person might count *up to*. That might be any number, but it does not take in all numbers.

What, now, of the past? One possibility is that the universe should extend no more than a finite time back before the present, but we should not want the only alternative to this to be that it should extend back infinitely far, as if the measurement of the number of equal units of time elapsed could be given by aleph-zero, past events being mappable onto the series 0, −1, −2, −3, . . . beginning from the present. It would seem that, if you cannot match an infinity of dates to events yet to come, then neither can you match an infinity of dates to events that have happened. And, if it makes no sense to speak of a point of time infinitely far off in the future, it is surely likewise misconceived to speak of an infinitely remote point of past time. The incoherence is in no way lessened by reversing the temporal direction. But is a potential infinity, the universe extending indefinitely far back into the past, a genuine possibility in this case? Open-endedness is acceptable with respect to the future, but is not mere potentiality at odds with our conception of the determinacy of the past? Compare Paul Copan and William Lane Craig: 'In order for the past to be a mere potential infinite, it would have to be finite, but growing in a backward direction, which contradicts the nature of time and becoming' (2004: 211).

It is here that the question of the symmetry of past and future becomes crucial. Those who insist on the reality of the past may wish to say that in transporting ourselves back in thought to a past day we are transporting ourselves to something that is already there. Days preceding that day, if they occurred, are a further extension of what is already fixed and determinate, and, as Copan and Craig observe, not part of a growing reality. With the future, by contrast, reality is continually being enlarged; when today gives way to tomorrow we encounter events which become real only when the new day is reached. But this contrast is misconceived. The terms of the succession are

unreal at every point outside the present, whether future or past. Moreover, to repeat an earlier point, what there will be is what there will be or will have been at some future time. Analogously, what there was is what there was or had been at some past time. At no future time will there have been an infinity of days starting from now, and at no past time was there an infinity of days leading up to the present. But the point about the future does not mean that the universe must come to an end, and the point about the past does not mean that the universe must have had a beginning.

However, if, with respect to the past, we exclude an actual infinite, surely that leaves us with a past extending back only a finite time. What would the remaining alternative, a potential infinity of past times, mean? This argument appears irresistible, but consider again the future analogue. We noted that a future-tense statement may be true through being verified when the appropriate time comes, but the statement may also be judged true if it is backed by sufficiently strong grounds before the event. As final truth, verification is the more important—so long, that is, as it can be had; otherwise there is only evidential truth to fall back on. The latter is what we have with counterfactual conditionals, as 'If he had ingested arsenic he would have died'. At least, this is what we have in the general case: such a conditional as 'If he had ingested arsenic he would have ingested a poison', advanced on the strength of the truth that arsenic is a poison, is perhaps best aligned with open conditionals which have proven true. At all events, while counterfactual conditionals are not themselves arguments (*contra* Mackie 1973: ch. 3), that is the form their support will take. Likewise with open-ended predictions. Take 'There will never be a last day', understood as 'The universe will go on for ever'. We reject a reading which would have us say, 'That is how things will turn out', but the other reading remains: there will never be a last day, not because the time will come when this will have proved true, when the universe will have been in existence for infinitely many days, but because there being a last day is a possibility we can somehow exclude. It does not appear initially possible to deny that either there will be a last day at some time in the future, or there will never be a last day, but while this has the appearance of a logical truth, that is not its standing if the first reading has to be rejected in favour of the second. On the second interpretation, we are dispensed from the impossible task of verifying the proposition on each of infinitely many days, but we do not have an exhaustive disjunction with 'Either there will be a last day at some time in the future, or the possibility of a last day can be excluded'. We can accordingly refuse to subscribe to

the first disjunct without having to embrace 'There will never be a last day'. Whether there will be a last day may remain undetermined at any future date we care to specify. (See Rundle 2004: ch. 8). The same point can be made with respect to the positive formulation, 'Either the universe will go on for ever, or there will be a last day'. To suppose that the first disjunct is true is not to suppose that that is how things will come to pass; it has to be, rather, that a successor to each future day is somehow assured. However, a lack of such assurance is not a ground for saying that there will be a last day.

The same considerations apply with 'Either there was or there was not a first day', which expands as 'Either there are only finitely many days leading up to the present, or there has never been a first day'. That there has never been a first day is to be understood as stating the impossibility of a first day, and once again this is not something we are obliged to endorse if we do not accept that there was a first day—where a failure to accept does not mean a positive rejection. Note that with neither argument are we querying the law of excluded middle. It is, rather, that the relevant propositions are not one another's contradictories.

A symmetric treatment of past and future is not a feature of the usual treatments of the fundamental cosmological question, 'Why does the universe exist?', but when seeking an answer we naturally, and seemingly inescapably, direct our speculations to what may have happened at an earlier time, to a big bang, say. We may not go along with Aquinas' arguments for a first cause, but we almost invariably head back in the same direction, whereas the future of the universe seems to be quite irrelevant to this question. Both theological and physical attempts at explanation make causation a key concept in these speculations, because it is in terms of causation that matters of existence are commonly explained, but it cannot be a concept that plays a part in any ultimate explanation of the universe. To anticipate our discussion of causation, we may reasonably insist that the idea of a divine creative act, an act of a supernatural being outside space and time, carries nothing of what we normally understand when we identify a cause or causal agent. But if a supernatural being does not enjoy a creative role, then neither too does anything in the physical world. How could anything within a system of entities causally explain the very existence of that system? We should do better if we set causation aside as just another phenomenon internal to the universe, a subspecies of change having application to certain patterns of development, as with the changes involved in impact and movement, in

growth and decay, but not being applicable to the universe as a whole, unless this should have been generated out of an earlier universe. Moreover, the only relevant causation, the only bringing into existence that we know of, is a matter of transformation. Bodies are not annihilated and created from nothing, but matter is given new forms, reorganized in different ways. The basic question—how is it that the universe exists?—is one that is the same at any time, just as it is at any place, and going back in time does not take you any nearer to an answer.

This analysis may be reinforced by an earlier point. It was suggested that there could be a universe in which there was no temporal direction. If we have a change from one state to another, then we have a temporal ordering, but suppose we have two events, e_1 and e_2, which ostensibly mark the beginning and end of the universe, but which do not occur against a background of change. How could we say which was which? There would be no way of giving substance to the supposition that e_1 occurred and *then* e_2, or vice versa, so no reason to say that a cause of one rather than the other was needed to explain the existence of the universe. If a change is introduced which determines a direction, this would appear a minor matter as regards the universe as a whole. Certainly, it cannot explain anything about the origins of the universe, but it concerns only an order of events within. That is, there is a total lack of significance in the matter of which terminus becomes beginning (past), which end (future). It is simply that there is a certain asymmetry *within* the universe.

What holds for causes holds for events generally. The only events are events in time, events within the universe, so there cannot be an event that got the universe going, that brought it into existence. Indeed, it cannot even be said that the universe *began* to exist. Not because it is of infinite duration, but because if something begins to exist there must be a time when it does not exist followed by a time when it does, and there cannot be a temporal division of this nature if there is no *before* the universe existed. It cannot be said that the universe *resulted* from a big bang, say, since that would have required a happening antecedent to the universe's existence, and even to say that it began *with* a big bang is questionable if the notion of a beginning is not in order here. For similar reasons, you cannot have 'Before the universe existed there was nothing'. There is again no *before*. But nor, speaking of some past time, can it be said 'There might have been nothing then'. There would have been no *then*. Likewise, we can rule out 'There might have been nothing now' and even 'There might have been nothing ever'. Very few of our

favoured explanatory categories continue to be of relevance when we move from happenings within the universe to the universe itself, and this holds when the explanation purports to be scientific as much as when it invokes the supernatural.

But what if matter meets antimatter in an explosion which annihilates everything? Or again, suppose that the universe is gradually depopulated, atom by atom. If the number of atoms is finite, at some point we shall have just one remaining, and if the possibility that there should be nothing is ruled out, then either that atom is assured of eternal existence, or at least some thing or things must take its place. What is to be said? We cannot resort to 'Where the universe had been there was now nothing', both 'where' and 'now' being without application, but instead of a specification of conditions holding subsequent to the end of the universe, we must define a condition which will allow us to remain within it. That might be given by such a form as: at any time the future duration of the universe's existence will be finite only. We have such a reading, but it does nothing to support the possibility that there might have been nothing.

The notion of a temporal beginning to the universe is in as much need of clarification or revision as is that of a boundary to space. When the question was raised (as by Locke 1690: Bk II, Ch XIII, sect 21) whether the universe was limited, it was supposed that a limit would have to be such a boundary. Finding this unacceptable, it seems reasonable to conclude that there can be no bounds to space. However, this is not the most fruitful way of understanding the notion of the finitude of space, of the universe as being bounded, but this is more usefully given a geometrical interpretation, a question of the path that might be taken on a journey out into the furthermost regions of space. If, however far we travel in a straight line, we eventually find ourselves revisiting known regions, rather than forever encountering new regions, then there is a sense in which our universe is not limitless. However, this customary analysis is not the only one possible, and we shall suggest an alternative at the end of section 10.2. It is curious that, while the need for a more sophisticated account of spatial limits is widely acknowledged, it is not appreciated that, if there is to be a temporal boundary to the universe, that too will have to be given an interpretation other than what is possible for temporal boundaries within the universe.

There is no time at which the universe did not exist. In that sense, it has always existed, though this does not mean: for an infinite time. The nearest we can get to 'The universe began to exist' would appear to be 'The universe

has existed for only a finite time', but that cannot replace the second premise in the version of the cosmological argument which runs:

(1) Everything that begins to exist has a cause of its existence
(2) The universe began to exist
(3) Therefore, the universe has a cause of its existence.

William Lane Craig maintains that 'the first premise is so intuitively obvious, especially when applied to the universe, that probably no one is his right mind *really* believes it to be false', and that the universe 'should begin to exist utterly uncaused out of nothing is too incredible to be believed' (Craig and Smith 1993: 57–8). But if the universe did not begin to exist, it did not begin to exist either as the result of a cause or spontaneously.

But, to be fair, should we not also recast (1) to fit in with the reading suggested for (2)? This will give us:

(1) Everything that has existed for only a finite time has a cause of its existence
(2) The universe has existed for only a finite time
(3) Therefore, the universe has a cause of its existence.

Attention now shifts from (2) to (1), which is far from intuitively obvious. If there is no time beyond the initial moment of the universe's existence, then the difficulties just noted in invoking a cause, whether physical or non-physical, are as pressing as ever.

Some, scientists and philosophers, acknowledge the impossibility of a supernatural cause of the universe, along with the impossibility that the universe should be able to account for itself, concluding that the only alternative is to regard the existence of the universe as a brute, inexplicable fact. If this means that the two propositions, that there should have been something and that there should have been nothing, are on a par, that it just *happens* that it is the former and not the latter that is true, then the existence of anything at all is indeed an inexplicable mystery. Is there an alternative? In arguing that there is neither a natural nor a supernatural explanation for the existence of the universe, we are excluding any appeal to *agency*, to the workings of some being or beings. What else remains? If I am right in refusing to accept that there just happens to be something, then it must be a logical principle rather than an agent that provides the answer. And what that principle is is clear: it is that something exists by way, not of physical, but of logical necessity. Just as it is not to a particular causal agent that we

turn, so it is not a particular being for which necessity is being claimed. It is a matter, at least in the first instance, of there having to be something or other, rather than there being something which has to be. Note that, on this analysis, it is simply false, not meaningless, to say that there might have been nothing. The question is taken further in Rundle (2004).

9.2 CAUSES, CAUSAL CONDITIONS, AND BACKWARDS CAUSATION

The asymmetry which comes about once causation is introduced does not destroy the past/future symmetry, but it is of course a major asymmetry, and one that has repercussions for what we can know about past and future respectively, and therewith what we are inclined to regard as real and fixed, what as unreal and open. However, while major, this asymmetry is not ultimate. That standing lies with the direction of change, of which causation is a special case. Whether causation can defy this ordering will be considered shortly. First, some further remarks on knowledge.

We have been concerned to keep apart ontological and epistemic asymmetries, but one way of drawing them together is to be found in Dummett's explanation of truth in terms of what is, can be, or could have been known. The demand that knowledge be merely possible in these ways would not appear to threaten the known with dependence on a knower, but the question 'Why should truth be explained in terms of knowledge?' is taken by Dummett to be the same as the question 'whether it is possible to swallow the conception of a reality existing in utter independence of its being apprehended', to which, as already glimpsed, he gives a negative reply:

> It seems to me that the existence of a universe from which sentience was perpetually absent is an unintelligible fantasy. What exists is what can be known to exist. What is true is what can be known to be true. Reality is the totality of what can be experienced by sentient creatures and what can be known by intelligent ones.
>
> (Dummett 2004: 92)

It is far from clear that agreeing that what exists or is true is what can be known to exist or be true commits one to regarding the perpetual absence of sentience as an unintelligible fantasy. In one sense, nothing can be known to exist or to be true in a universe in which there is no being capable of knowing anything, but should not the focus be more on the states of affairs which the

condition of knowability circumscribes? It is a matter of what can or could be known or experienced by a suitably equipped subject, but there does not have to be any such being for this to be an appropriate constraint. Dummett allows that we have good reason to suppose that the universe was at some stage devoid of sentient creatures, but he does not consider it possible that this should have been so throughout its existence. However, if a universe without sentient creatures can be contemplated up to the dawn of life, what makes for the impossibility of an indefinite continuation of this lifeless state? Since the content of a description of physical reality is given by its consequences for a possible observation of it, Dummett considers it an illusion to think that we know what it is for physical reality to exist in a universe devoid of sentient life (1994: 359). However, he considers it unperplexing that we can describe the actual universe as it would have been if life had never developed in it (1994: 351), so once more we are left wondering why there has to be sentient life at some point when its absence at other points is a possibility. What, he asks, would the difference be between the existence of a universe without sentient creatures and there being no universe at all? A natural response is that, trivially, there would be no difference at all *to* any being, but a universe of lifeless matter would not on that account collapse into an empty universe. Again, a consideration is being advanced which, if accepted, would appear to preclude the universe from ever being without life, yet it is allowed that a lifeless period is possible. If sentience is ineliminable, the question arises as to how life came about. Dummett's idealism is to the fore in his approach to the question:

> Very evidently, we do not create the material universe. It nevertheless exists *in virtue of* the experience that we, together with whatever other sentient creatures it contains, has contained or will contain, have of it. If this is right, to think that our existence is *explained* by the development upon this planet, first of the simplest organisms, and then of their evolution into more complex and eventually intelligent ones, is to put back to front. Of course, our habitat must be such that we could have come into existence; but it exists because we exist, together with many others on this earth, and perhaps with others in remote, or very remote, parts of the universe, not the opposite way about.
>
> (Dummett 1994: 352)

It is difficult to see how our habitat must be such that we could have come into existence, yet it should owe its existence to the life that subsequently developed in it. The argument is reminiscent of the anthropic principle, which would have it that we can *explain* why the universe is more or less as

we find it by appeal to the undoubted truth that we should not otherwise be here to observe it.

Back to the question of possible asymmetries between past and future. The idea that the past is real, the future not, often goes along with the view that the past, unlike the future, is fixed, unalterable. However, to revert to our earlier argument, to speak of changing the future makes no more sense than to speak of changing the past. Changes are effected when things that are one way are made to be another, so changing the future would require that it already be in a certain state which we, through a present action, might alter. Subtract this unsatisfiable requirement and we are left with no more than the claim that a current action may determine how things turn out. Changing the past is equally nonsensical, but could anything that happens now be responsible for changes which have already taken place? In other words, is backwards causation possible?

Before addressing this question it is useful to say something about causal relations more generally. Causation may take more than one form, but its principal manifestation is found with respect to changes which come about as the result of the action of one thing upon another, as may be illustrated by any number of transitive verbs. Witness *grind, compress, lower, twist, melt, submerge, divert, shrink, burn*, and countless others. Agents can be either animate or inanimate, and 'act upon' has to be taken in a broad sense, so that, for instance, such 'acts' as those of *magnifying, supporting*, and *dropping* are covered, though I should hesitate to extend the characterization to instances of *failing* to act. Negative causes—not doing such and such—clearly do not favour the association of causing with acting upon something, but then neither do they mesh with the more general notion of causing as a species of *doing*. If you fail to remove a bad apple from the basket, the others may rot in consequence. Your failure is not a matter of doing anything, but it is a failure to prevent things from taking their course, which in this instance is a failure to prevent a cause from operating.

Negative causes fall more readily under the heading of causal conditions, as found with such constructions as 'The high value of the pound caused a fall in imports' or 'The length of the girder caused it to buckle'. The subjects here of 'caused' do not introduce causes as understood above—the length of the girder does not act upon the latter—but the sentences paraphrase as 'It was because the value of the pound was so high that imports fell' and 'It was because the girder was so long that it buckled', where reasons rather than agents are cited. This use embraces such negative conditions

as given with 'lack', 'inability, 'absence', and the like, and it can also take in enabling conditions, as in this example: 'A climber, Don, takes a rope because he believes (perhaps falsely) that it will cause him to survive if he slips' (Mellor 1995: 1). This use of 'cause' rings oddly to my ear, 'enable' being more natural, but we can speak here of a causal condition in the sense of a condition which may facilitate or make possible the action of a cause in our preferred sense. Again, if a pencil is sharp or a pen is filled with ink we may be able to write with them, but the causing belongs with something more dynamic—the movements of our hand. Some have thought that the action of a cause cannot be concurrent with the effect produced. Whether or not this is so, there is certainly no difficulty in having a causal *condition* hold at the time when the cause acts.

It is important to be alive to the distinction between the two uses of 'cause'. Accounts of causation threaten to come to grief through their inability to handle ostensible instances of causation—negative causes being a case in point—when the intractable instances should be seen as showing the need to keep agent and condition apart. The distinction is especially useful when considering analyses centred on necessary and sufficient conditions and/or counterfactual propositions. David Lewis's account in terms of the latter would have the 'scoffer' say that, since one would not die if one had not been born, one's birth must then cause one's death. This is indeed so, Lewis maintains, but it is understandable that we seldom say so: 'The counterfactual dependence of his death on his birth is just too obvious to be worth mentioning' (2000: 196). That we may agree, but it is not this counterfactual dependence that we, and the scoffer, are querying, just its capacity to capture the causal proposition—'One's birth causes one's death'—precisely because of the latter's dubious standing. However, while 'If he had not been born, he would not have died' does not sustain the causal proposition, it can perhaps be taken as specifying a causal *condition*.

Likewise with states and dispositions, which qualify as causal conditions rather than causes. In presenting his causal theory of action, a theory which attributes a causal role to beliefs and desires, Donald Davidson allows that states and dispositions are not to be reckoned among causes, since only events can have that standing, but he considers that an appropriate event is always to hand with the onslaught of a state or disposition (1980: 12). If by 'onslaught' Davidson means 'onset' or 'beginning', we have not yet been taken to a cause. The onset of an illness is not the cause of that illness, nor the beginning of a heat wave the cause of the heat wave. What may be said is that a full causal

explanation requires us to introduce reference to a triggering cause along with a state or disposition which provides an enabling condition for that cause to operate. That demand is not met just by fastening on the beginning of the state. There are many other problems associated with the notion of mental causation—for instance, the idea of a thought acting upon anything is of dubious intelligibility—but the issue is too large to be taken further here. It is treated at length in Rundle (1997), and some of the main considerations are taken up again in Rundle (2004: ch. 7). A relevant consideration will be mentioned below.

The involvement of three terms—the agent, the thing acted upon, and the resultant change—is an important feature of the present account. *C*'s acting upon *B* in the ways instanced just *is* the causing of some state or happening *E* by *C*. So, *C*'s acting on *B* is a matter of, for instance, *C*'s freezing, melting, or tearing of *B*. These verbs give the form the causation takes, and the effect (result) is that the object freezes or is frozen, melts or is melted, tears or is torn, 'is frozen (melted, torn)' referring either to a continuing transformation or to the way the object ends up. Some have felt that the cause-effect *relation* poses a problem in that, for it to hold, both of its terms must exist, a condition which will not be satisfied if, as may happen, the causative act is over and done with when the effect comes about. We may regard this as an unwarranted constraint on relations—we happily say our past profligacy preceded our present poverty. However, we note that on the current approach, the cause and the object acted upon will commonly coexist, and the notion of a relation is perhaps more in place with respect to these two, in that the agent's causing of an effect is not in general an instance of an agent standing in a relation to something, an effect, already realized when it acts; it is not as with *A*'s lifting, burning, or shattering of *B*.

The absence of any appeal to a law or other form of generalization is a further feature of the current approach. This omission has to face the objection that if *C* has brought about *E* in certain conditions, then it must bring about *E* if those conditions are repeated, a failure to do so meaning that *C* was not in fact the cause of *E* in the first instance. I would suggest that this consequence is not inescapable, that our confidence that such a failure will not be met with is not based on our understanding of 'cause' but derives from our adherence to the Principle of Sufficient Reason: different outcomes of seemingly comparable initial conditions are always explicable. Thus, suppose that, having learned that it is possible to bring about a certain change in a certain way, we find that our usually reliable means lets us down, despite what

appears to be a repetition of the circumstances in which the cause had been efficacious. The natural supposition, in accordance with the Principle, is that some non-apparent factor is interfering to prevent the cause from operating, but suppose that this is not so. This is a circumstance which the Principle cannot tolerate, but can our concept of cause? Could we, that is, continue to insist that *C* had caused *E* when certain conditions held, even though it now fails to do so when those exact circumstances are repeated? I am inclined to think that the evidence for past causation could be so strong, we should not be obliged to dismiss it, but could consider the Principle to be the casualty of this turn of events: not every failure of causation is explicable.

It was suggested that the direction of time can be understood by reference to the direction of change, a change simply from one state S_1 to another state S_2. No causal relation between S_1 and S_2 need be implied, but such a transition also underlies the direction of causation, the very concept of causation thus excluding any reversal of the customary direction. This directionality is confirmed by taking our account of causation a stage further. So far we have that *C*'s causing *E* is a matter of an agent, *C*, acting upon something, *B*, to produce *E*. Such a paraphrase has the virtue of drawing attention to the need for something to be acted upon, but it does little beyond that to clarify the causal relation, given its reliance upon the evidently causal 'produce'. Likewise if we were to use 'bring about'. We have a weaker condition if we speak of *E* as happening *when C* acts upon *B*, but this is clearly too weak; any number of happenings may take place at that point of time without being relevant effects. What is needed is that *C*'s action upon *B* should constitute a process which culminates in *E*. That is, we want there to be physical continuity of such a kind as to leave no room for any other series of changes leading up to *E*. We can see how this is realized with familiar instances of causation, but the notion of such a progression has no application whatsoever with respect to backwards causation, so offers no way of identifying true from apparent causes in that direction. This point, which we shall develop shortly, is one which, we may note, also puts paid to supernatural causation, and, indeed, to putative mental causes which have no physical realization.

There is an analogy here with a problem of identity touched upon above. We imagine a body suddenly vanishing without trace, and subsequently another body, indistinguishable from it, appearing. If there is continuity over space and time between the two bodies, we can affirm their identity, but suppose there is not and suppose, too, that we find not one but two succeeding replicas. No longer having the criterion provided by spatio-temporal

continuity, to say that one rather than the other is to be identified with the original would appear arbitrary. Similarly, to avoid arbitrariness in our assignment of causes in a complex of changes, we need to be able to trace a suitable path from a cause to the relevant change effected. If our putative cause is non-physical, has no spatio-temporal location, this will not be possible. We are not so much concerned to dismiss a metaphysical relation on the grounds that it is meaningless, we are merely pointing out that a metaphysical relation is, of its nature, not up to the task.

Another point which tells against both backwards and supernatural causation is the following. Suppose it is held that supernatural causation must be acknowledged as at least conceivable, that we can coherently suppose that God should cause a snake to exist. Imagine, then, God declaring, 'Let there be a snake!', and a snake appearing out of nowhere. But that is not to imagine God *bringing about* the existence of the snake. And it is not because *saying* is uniquely inefficacious. Any other 'act' by a non-physical being will be equally distant from anything we should recognize as a cause of existence. Likewise with backwards causation. In either case, all we imagine is a pair of events; the supposition of any link, beyond—at best—their spatio-temporal propinquity, is without foundation. Nor, for that matter, does reducing the temporal gap between the members of the pair render causation between them any more intelligible. God's saying 'Let there be a snake!' minutes before a snake comes into existence is no less mystifying as a cause of the snake's appearance than if he had uttered the command when, at the dawn of the universe, he proclaimed, 'Let there be light!'. In neither case, finally, is it to be conceded that the causation is at least conceivable, at least a possibility. That requires that we should at least know what *might* have happened, and it is precisely on this point that we are left in the dark.

The impossibility of reversing the causal direction appears indisputable. However, there are dissenters. For instance, Dummett writes:

> There is no logical necessity that causation should always run in the earlier-to-later direction; it is simply our experience that it does so. Apart from prayer, we know no way of making it more probable that some event should have previously occurred.
>
> (Dummett 2004: 83)

Apart from prayer? So we actually *know* that prayer can make the prior occurrence of an event more probable? Most of us are not party to this knowledge, but even if we are in error in believing it the height of superstition to suppose that prayers for anything, past or future, can lead to supernatural

interventions in this world, the example of prayer remains of interest. If God can foresee the future, then he can foresee someone praying that such and such will have been so, so if we had reason to suppose that what we desire is more likely to be granted us by God if we pray for it than if we do not, then it makes sense for us to pray to this end, and that prayer can be said to have influenced God and thereby what he did in the past.

God's foreknowledge is to mirror the knowledge had in memory, a direct awareness of a future happening rather than knowledge based on an inference. There is, after all, much we know in the latter way about what is to come, and we may imagine a lesser being than God able to predict that someone would pray to him for a certain desire to be fulfilled, and acting to fulfil that desire in consequence, prior to the prayer. But, of course, we should not think of such a prayer as a recipe for making a past occurrence more probable, because we should know that this being's conclusion that we shall pray is based on our past patterns of behaviour, and owes nothing to our actual praying at some future date. The being will have decided that we shall (or shall not) pray, and on the basis of that decision acted (or refrained from acting) in our favour; whether subsequently we do or do not pray plays no part in determining that sequence of events. True, when divine foreknowledge is at issue we may think in terms of a direct awareness by God of our prayer in advance of its being offered, and if this is a matter of our prayer somehow generating God's knowledge, or otherwise influencing him, we have backwards causation. However, there is so much here that is questionable—if it is even coherent—that we can hardly claim to have established the possibility of such causation by these speculations.

Without a causal link, it would appear that one's ostensible knowledge of a future happening or state of affairs could owe nothing to the latter's being as it will be, but if we are right in rejecting backwards causation, we have no grounds for considering the required link possible. It was suggested above that with respect to some senses a causal theory appears inescapable: tactile sensations informing us of the presence and character of a body must be produced by contact with that body if we can be said to feel it. With sight the conceptual involvement of causation is less clear. Perhaps our ordinary conception is not inconsistent with the ancients' view that a ray emanates from the eye to the object seen, rather than the other way around. There are ways of speaking which give superficial support to this conception—'When she looked *through* the mist *towards* the hillside, her gaze *fell upon* a scene of devastation'—a conception seemingly needed if, as in some formulations

of quantum mechanics, the observer is literally to affect what is observed. However, even if we do not press for a causal theory of vision, we know that in fact it is not possible to see something if the requisite information is not imparted by the object in light reflected or emitted from it, and even if the ancients' alternative were correct, there would still have to be an analogous relation which could not be satisfied if the object seen was not yet in existence.

Accounts of causation in terms of necessary and sufficient conditions are more congenial to the possibility of backwards causation than is the present analysis. If to such an account we added the condition that the first of two regularly associated events was to be denominated 'cause', the second 'effect', we could be accused of basing the temporal priority of the cause on an insubstantial point of usage, Indeed, some defences of backwards causation appear to rely on the claim that it is a matter of no more than terminological significance that we should use the terms in this way. However, this is not how we have proceeded. The notion of action upon something, which leads to the state of affairs or change which we classify as an effect, outcome, or result, requires the existence of something to act upon. Nothing would count as lifting, polishing, cutting, or bending something that no longer exists. The causal process cannot even get under way in such cases, an observation based on our understanding of what constitutes causation, and not simply a lesson that experience has taught us.

The case for the possibility of backwards causation is not helped by appeal to the pattern of developments which might be displayed when a motion picture film is played in reverse. The problem is not that it would, with such a reversal, be impossible to furnish causal explanations, though clearly this would raise difficulties. First, we note that, in a world which this portrayed, it would be wrong to speak of, for instance, the billiard ball moving into the pocket before, rather than after, it had been struck by the cue. The film would show only the *emergence* of the ball from the pocket; it would not reveal a striking with the cue, but a movement *away* from the ball when this had stopped. It is important to carry through the general idea consistently, envisaging the changes within events, not only events as a whole, in reverse order. A failure to take this further step may lead us to overlook the highly problematic character of, for instance, our perceptual concepts in a world where all is reversed. Thus, the sequence of events presented by the film does not show what we would experience were we inhabitants of a world in which everything in fact occurred in reverse. In

such a world, light and sound would not impinge upon eye and ear, but would emanate from them, thus destroying, at least as we know them, the channels of information we rely on for knowledge. Those who are impressed by the time reversal invariance of many physical laws often underestimate the difference between the present universe and one in which the time-reversed laws operated, a universe in which so much—including, it would appear, all sentient life—would become impossible, and so much causally inexplicable (cf. Maudlin 2002).

However, the main point is that success in discerning causal relations in a world in which the familiar order of events is reversed does not confer intelligibility on *backwards* causation. A thoroughgoing reversal would not mean that time was reversed, with an effect now occurring before its cause. There is no question of time itself, rather than the order of events in time, being reversed, and in the world conforming to the reversed film, it will not be a matter of E occurring before C, but of E^* occurring before C^*, where E^* and C^* are what our familiar events C and E become after they themselves are reversed. The occurrence now of E^* before C^* offers no support to the idea that the later event, C^*, might cause the earlier E^*; we are simply presented with the additional difficulty that C^* is more than likely to have lost, with the reversal, the structure which would allow it to be a possible cause of anything. But in so far as there was scope to apply the notion of cause as now understood, it would continue to be in the direction of change, and however inexplicable changes in this world might be, change would still be from earlier to later.

Dummett thinks otherwise, suggesting that

> so far as the concept of cause possessed by mere observers rather than agents is concerned, . . . we can conceive of a world in which a notion of causality associated with the opposite direction would have been more appropriate and, so long as we consider ourselves as mere observers of such a world, there is no particular conceptual difficulty about the conception of such a backwards causation.
>
> (Dummett 1964: 335)

But again, whether or not we consider ourselves as mere observers, change, and hence causation, is from earlier to later states and happenings; that it is never from later to earlier is not an empirical discovery.

Dummett has drawn attention to an interesting parallel between an argument for fatalism and an argument against backwards causation (1986: 141–7). Suppose we have an event, E, of surviving an air raid, and an action,

A, which is one of taking refuge in a shelter. The fatalist argues that either *E* will occur or it will not, and then claims:

If *E* does not occur, *A*, if you did it, will have been fruitless.
If *E* does occur, *A*, if you did it, will have been redundant.

Conclusion: the action proposed for enabling one to survive an air raid will be either fruitless or redundant. Dummett observes that, while the first claim is correct, the second is not: *A* is redundant, when *E* occurs, only if *E* would have occurred even if *A* had not been performed, whereas the second claim says no more than that, if *E* is going to occur, it will occur even if you do not do *A*. Consider now the analogous argument concerning the past, where *B* is an action proposed to bring about a previous event *F*. Either *F* has occurred or it has not, and it is argued that:

If *F* has not occurred, then *B* will be fruitless.
If *F* has occurred, *B* will be redundant.

Again, it is concluded that the action proposed to bring about the past event will be either fruitless or redundant. Once more, the first statement is correct. What of the second? Clearly, if backwards causation is possible, this will not be so: *B* could still be necessary for the past occurrence of *F*. The statement assumes the impossibility of such causation; it does not provide a demonstration of its impossibility.

But could a present event be necessary for a past occurrence? Any candidates for effects of a cause yet to exist should not be explicable by appeal to prior events, so let us suppose that we have happenings which cannot be accounted for causally at the time of their occurrence. For instance, an object mysteriously rises from the top of the table on which it had been lying. The natural objection is that, if such a movement takes place, no future happening can enjoy the standing of a necessary condition for this event. Whatever happens or fails to happen, that the object has risen will remain an incontrovertible fact: if the object rises, we cannot say that this is a state of affairs which did not obtain if some putatively necessary condition *C* does not come about. But does that make it impossible to claim that the object would not have risen if such and such an event, *C*, had not subsequently taken place? We are to infer that, if the body is observed to rise with no apparent cause, then *C* will eventually take place. This, we shall suppose, is well established. If *C* does not take place, then the appropriate inference to draw, under the hypothesis of backwards causation, is that *C* is necessary for

the rising only in certain conditions, that the rising was, on this occasion, caused by some other (subsequent) happening; or, failing this, that it is simply inexplicable, an uncaused event. What we are in effect maintaining is that the notion of a necessary condition is indifferent to questions of temporal ordering. As a parallel, imagine a being capable of foreseeing events. If *E* is an event he foresees, then, it may be argued, nothing that happens in advance of that date will be necessary for *E*'s occurrence. Given the proven reliability of our oracle, that *E* will take place is a well-founded supposition. However, all this implies is that, if some earlier event is necessary, it is equally certain that it, too, will occur; that if a putative necessary event does not take place, then it will not have been necessary after all.

The problem, when the temporal order of cause and effect is reversed, is not so much in allowing that *C* might be a generally necessary condition for a prior event, but to see what might entitle us to speak here of *C* as furnishing an *explanation* of that event, since an explanation of how *x* caused *z* involves the mode of interaction of *x* with something *y* in bringing about *z*—witness again bending, melting, compressing, cleaning, and so forth. There surely could be events whose non-occurrence was physically impossible, given what had preceded, but they would not be necessary *causal* conditions of the earlier happening. There is no explanation as to *how* the object which mysteriously rose was made to rise—not to mention the apparent incoherence involved in crediting the happening to the agency of a being which may not as yet exist.

Or is this simply to give voice to a prejudice, born of the unfamiliarity of such out-of-the-way happenings? We say that the motion of a body cannot be put down to the agency of something which does not as yet exist, but if *x*, having set *y* in motion, is then destroyed, we can happily say that *y*'s motion is due to something which no longer exists. Why such a difference between 'not yet' and 'no longer'? In so far as neither (supposed) agent exists at the time of the body's current motion, there is no difference, but there is an asymmetry in the absence of any physical contact whereby the future cause might impart motion. Given that an act of bringing *y*'s state of rest to an end cannot be imagined to occur after *y*'s starting to move and still receive the description, 'act of bringing *y*'s state of rest to an end', and given that no other act appears to fare any better in this respect, it would appear that future acts which normally have no tendency to set anything in motion are just as suitably invoked as candidate causes. But this surely means abandoning any of the factors that would be explanatory of motion. Some pattern of necessary

and sufficient conditions may be in evidence, but events will not be structured in a way that allows us to introduce a causal verb into their description. We should naturally add to any pattern of necessary and/or sufficient conditions the more negative requirement that the event be inexplicable by reference to preceding happenings, but while that may appear to clear the way for an explanation based upon subsequent happenings, it in no way advances the case for a cause from later to earlier; it simply amounts to excluding all possibility of a cause.

But if some straw were suddenly and inexplicably to burst into flame, if there simply was no event which correlated with this happening other than some subsequent event *C*, and if this correlation became the norm, might we not in the end be obliged to allow that it is, after all, *C* that is responsible for the burning? But how could this conclusion be superior to the supposition that the bursting into flame and *C* were both brought about by the same cause? After all, the correlation does nothing to plug the gap left by the absence of any recognizable realization of *acting upon*, and hence of *bringing about*. Suppose now that when, and only when, straw starts inexplicably to burn, I subsequently turn on the bathroom tap. However regular the succession, it would never be correct to describe my action as one of setting the straw alight, and even if we substitute striking a match for turning on the tap, we should not be able to advance beyond the description: spontaneous ignition of straw followed by a match being struck.

Very well, I am clearly not setting anything alight in a way that compares with putting a flame to something, but the causation has to be thought of on the model of a chain of causes: I do something which ultimately has the effect that the straw catches alight. But, of course, it is a matter of doing something which, before I have even done it, has had the effect of setting fire to the straw, and there is no way of filling in what we should recognize as intermediate causal links in a process of that character. Likewise with filling a glass. There is the obvious objection that you could not fill an already filled glass, but this should not be allowed to count decisively against backwards causation, since we are to imagine an earlier time when the glass was empty and would then have been observed to fill, and it is this happening that a presently occurring act might supposedly bring about. However, the difficulty is only deferred. Imagine the glass filling at the earlier time. We could suppose that this event had a normal antecedent—water flowed into the glass from a tilted jug, let us say—but at some point normal antecedents must have given out if we are not to have had an instance of filling the glass which is to be described and

explained in the usual way. That is, at some point the series of happenings leading to the filling will have ceased to connect with what had gone before, but instead continue a sequence which is yet to begin, a sequence which our contemporary agent will initiate. But how could the earlier succession count as an extension or continuation of the later one? Any events which might intervene between effect and subsequent causal act will at each stage be devoid of anything we might recognize as a generative link. Indeed, this is a good way of bringing home just how much is comprehensible in familiar causal processes compared with the bare associations with which a Humean is satisfied. Hume argued against the notion of causal connection, at least in regard to causation as it can be known by us, but there is a necessary and unproblematic physical connection involved in such a causal act as peeling a potato, and one that cannot be found at a time after the peel has gone. We have also noted that the unidirectional character of change, which we have used to ground the *earlier than* relation, is exploited in our rejection of the supposed description of causation, any action of a present cause taking us, as it develops, ever further way from preceding events. It is not a mere fact of nature that causation goes from earlier to later, any more than it is that time follows this ordering.

It is instructive to compare backwards causation with the supposed causation met with when something persists in a given state. According to J. L. Mackie, when a top rotates, a cause of a given rotation is to be found in the preceding rotation, and if a pen exists at a given time it will owe its existence, at least in part, to its existence at earlier times (1974: 156–7). It is difficult to see how a place could be found here for such causation—earlier phases of persisting states do not act upon anything, do not generate later phases. It is because he has pared causation down to a relation of necessary and sufficient conditions that Mackie can see no good reason for not speaking of causation in these cases, even though, as he acknowledges (1974: 157–8), we do not customarily consider causal explanations of such persistence to be required. But we do not regard the act which set the top spinning as accounting for *just* the first rotation, and the absence of change involved in continuing in being means the absence of anything which calls for a causal explanation. However, if, as Mackie would have it, successive phases are reckoned to produce what follows, then it will appear arbitrary to restrict the causal relation to cases where the cause operates no later than the time at which the putative effect starts to come about. The only difference between this relation and one in which the effect comes first will be one extrinsic

to these readily reversible processes, namely a difference in the time of occurrence. We shall just as readily infer earlier from later phases as later from earlier, the pattern of necessary and sufficient conditions applying in a way that is indifferent to time. To have anything of substance to the causal relation we should wish to find some sort of irreversible discontinuity, or at least asymmetry, and this is just what we do have with the processes which we in fact classify as instances of causation.

Again, it is as with mind-body relations. On a Humean view, whereby anything can cause anything, there should be no problem in conceiving of psychophysical interaction. If constant conjunction is all there is to such interaction, then the notion of a thought causing a bodily movement is no worse and no better than that of one movement causing another, yet it is surely only if a physicalist conception of thinking can be sustained that it will be possible to speak of a thought impinging upon the brain. It is, more generally, an illusion to suppose that our concept of cause can accommodate just anything which might occur in a relation of regular concomitance, so that even metaphysical relations may qualify as causal without further argument.

As it happens, the issues of backwards causation and mind-body interaction come together with the suggestion that when we engage in an action, as moving our arms, we thereby bring about the neural events necessary to, yet antedating, that action (von Wright 1971: 76–81). Does not the instruction, 'Move your arm', give a recipe—the very best—for ensuring the occurrence of such events? I have no difficulty accepting the finding, disconcerting to some, that neural events which result in the movement of a limb may take place before the agent has chosen to make the movement. I have no difficulty, since I do not regard choosing, deciding, or intending as causes of anything (Libet 1983; Rundle 1997: ch. 7). Or again, if a reason for acting is not a cause of the acting, the role of the reason is not usurped by whatever is the cause. If this is granted, there is no pressure to regard choosing as bringing about anything, whether past or present, which might lead causally to the movement, but in any event, whatever I should do now, we should not reckon it a matter of *bringing about* if the events have already taken place when the movement gets under way. I cannot move my arm without the neural activity, N, having taken place, but if there is causation here, it can be only from N to the action, not in the other direction. And not in *both* directions, with N causing the movement and the movement causing N—a possibility which von Wright's position allows. But if it is up to me to act or

not, as I please, then is it not up to me to ensure or determine that *N* took place? Certainly, my action could be said to make it true that *N* took place, but that is a matter of giving *proof* that *N* occurred. The sufficiency is not causal sufficiency, with a temporal direction, but mere inferential sufficiency, detached from temporal considerations.

9.3 TIME TRAVEL

A topic which raises some of the same issues as backwards causation is that of time travel. Indeed, one ground for rejecting time travel lies in its apparent commitment to backwards causation: if setting a time machine in motion today 'leads to' its earlier arrival years ago, then the causation is of that variety. There is more than one way in which such travel might be understood, but on any interpretation of interest there are obstacles to allowing it to graduate from science fiction to serious science. On one conception, the future time traveller who will one day come back to the present scene is not here now. He has yet to make the journey. On the other conception, if a time traveller is going to journey back to the present day, then he must be here now. Both conceptions are incoherent, though the second is of greater interest. The first requires us to rewrite history. If you go back into the past now and converse with people at the turn of the century, then your presence then will have to be one of the events of recordable history. It cannot be that there was then no visitation from you, but that this came about only a century later. How could it be a matter of your being there on the day in question if that were so? It is as though the fact that at time *t* the time traveller is not present at place *p* were no barrier to the future truth of 'At time *t* the time traveller was present at place *p*'. Note that the time traveller is represented as getting out of his time machine *after* he got in, but since he gets out in an earlier era, he does so *before* he got in—so had no need to make the journey. On either reading, the time machine is supposed to be instrumental in bringing about the traveller's presence at the earlier time, but if he was there, he will have been there for ever more, and any 'journey' back will be unnecessary.

Time travel is often rejected on the grounds that, if it were possible, we could journey back to the past and bring about changes which would have altered the subsequent course of events. So, someone could go back and kill his mother before he was conceived, thereby preventing himself from being born and killing his mother. To this it has been retorted that time travel

is not thereby shown to be impossible, but only that, if it were possible, certain actions could not be performed (Malament 1984). In this instance, any attempt at killing one's parents would somehow be thwarted. However, the difficulty is more extensive than such examples reveal, there being a contradiction in *any* visitation to the past which would mean that a person appeared at some time when it is also true that he had not been there at that time. It is not necessary that he attempt any action. The same point applies to the suggestion that a series of failures on the part of numerous people to kill their grandfathers would require explanation. It would be too much to accept an indefinitely long string of such failures as no more than coincidental, yet we should not wish to posit a mysterious force which came into play to prevent a successful killing (cf. Lockwood 2005: 165–6). On the conception of time travel currently being considered, this fantasy is not one that need concern us. Since the would-be killers were not there at the time, there were no actions on their part which might have succeeded or failed. More generally, the basic reason for rejecting travel into the past lies further back: not in the consideration that one might have engaged in actions inconsistent with the way the world currently is, but simply in the traveller's both being on the scene at the time (as a result of his supposed journey) and not being on the scene at the time (as shown by history and his later birth).

The view which has it that the traveller was not present in London on New Year's Day, 1900, but that he can now go back to that time and place treats distant times as if they were distant places. It is the concept of travel that is inapposite, as if it were to be understood as we understand travelling to another part of the globe. Again, why speak of *going* back into the past, when there seems no way of making sense of *movement*?—something that is so even with respect to the future. Let us then abandon talk of travel, and—moving to the second conception—insist that a visit to the past will have a place in the history of that time, being recorded as, say, a sudden inexplicable materialization of a person. If you 'went back' and killed your mother, that killing will have its place in a full chronicle of events at the time in question, so whoever you killed it cannot have been someone who subsequently conceived you. The real problem concerns not the nonsensical notions of revisiting or changing the past, but the extension of our concept of identity to cover both a being who exists now and a being who ceased to exist before the birth of the former. It is sometimes thought useful to distinguish 'subjective' or 'personal' time—the time which our traveller would register

on his journey—from 'objective' or 'external' time, this being the time which extends from his arrival in the past to his departure in the present. If subjective time is in some sense a measure of the time the journey took, and this is a journey which terminates with the traveller's arrival at a place where he had not been, as on the first conception, then we are back with our contradiction. If, as on the second conception, the traveller had existed at that earlier time, we still have no explanation how the earlier being could be the same person as our time traveller. And of course, if he did exist then, there was no journey back which brought him there, so no journey to be timed.

One of the advantages of talking in terms of time travel is that it appears to solve for us any question of identity. If *A* really does go back in time, then it really is *A* who is to be found at the earlier time. The person who sets off in the time machine is without question the person who gets out of it at the end of his journey. If we forgo talk of travel, so do not avail ourselves of this assured presupposition, we are left with the supposition of a being, allegedly *A*, at the earlier time, and *A* existing in the recent present, where earlier *A* meets every condition to be identical with the later *A* apart from those stemming from the consideration that the earlier *A* was in existence before the later *A* was even born. Since it is logically possible that the earlier *A* should have stayed around long enough to witness his own birth, shake hands with himself, and so forth, it seems we are obliged to acknowledge that we might have, at the same time, two of the same person, and this offends against our conception of identity. Could we relax the usual demands which identity makes?

Consider a turn of events which, I suggest, is symmetrical with this. Someone 'journeys' from the distant past to the present. So, a person materializes before us, claims to be the historical Socrates, and proceeds to say and do anything we might expect of the real Socrates. Given that Socrates died many centuries ago, that the matter of his body was irretrievably dispersed after his death, we are precluded, it would appear, from accepting that this person is, literally, Socrates, difficult though it may be to explain how a person could come by the knowledge which one would suppose unique to the historical figure. Note, incidentally, that possession of the relevant knowledge and other features is not *explained* by supposing that it is indeed Socrates who confronts us, since it is precisely the factors which normally allow the appeal to identity to have such an explanatory role that are lacking in this instance. That is, if you report a past happening, your presence as a witness would explain how you come to be able to make the report, and

give us at least prima facie grounds for thinking what you say to be true. However, this explanation of your ability to remember is only as good as the claim that you were there at the time and place in question, and this is just what is so unclear in the present case. This point might have been made in our discussion of reincarnation. One who believes that a living person could have been someone now dead might insist that a mere decision to speak in this way cannot have the explanatory value of a hypothesis that something essential to the former person has been transferred to the latter. There is no explanation on offer from an unexplained notion of transference.

We are enquiring whether a more liberal notion of identity is of any possible use here. So, for instance, as a species which falls short of strict identity, we have identity in some respects only, or an equivalence relation. Your car is the same make and model as mine without prejudice to there being two cars. Or again, as well as identity in some respect, which is transitive—if the respect is held constant—we also have identity in some degree. So, something which changes over time may be more or less the same from one time to another. The person who materialized in the distant past and claimed to be you, a citizen of a later century, cannot have his claim accepted. But how important is the literal failing of identity in the overall picture? Must everything that matters to us require strict identity rather than identity in some respect or to some degree? The youngster in the photograph is none other than the elderly gentleman you see before you, but what does the rule of language with which this conforms yield of greater substance than comes with satisfaction of one of the weaker forms of identity? If strict identity can tolerate such differences in the life of a single individual, if in addition identity is consistent with the replacement over time of the matter which goes to make up a person's body, then perhaps we should be prepared to tolerate the possible differences which the weaker forms allow. A remarkable fact would remain: the materialization of a person bearing an uncanny likeness to a person from another era, and apparently enjoying first-hand knowledge of that other's life. We should not speak of time travel, nor of literally the same person, but there would be cause enough for wonder none the less. Less charitably, the sudden formation, out of nothing, of a complex human being, is an absurd hypothesis, but any incoherence from which it suffers is not that to be found with time travel. The same point holds if we envisage the future materialization of a being who replicates someone now alive.

The following fantasy offers interesting points of comparison. Suppose that a person wishes to be frozen at the point of death in the hope that at

some future date it will be possible to thaw him out and restore him to normal life and health. Imagine that, about to subscribe to such a scheme, you are informed of an alternative plan: instead of having your body preserved, a comprehensive record of the disposition of all your material parts, right down to the smallest bit of matter that makes for a difference at the macroscopic level, can be drawn up, and at some later date a duplicate of you pieced together. This future being will not, strictly speaking, be you, for a familiar reason: if one copy can be made, there need be no stopping here, but two, or even more copies might be assembled, and our concept of identity cannot allow that a single person should come to be identical to two or more clearly distinct individuals. However, this person will swear that he enjoyed an earlier life—yours—with as much conviction as the thawed-out version with the unimpeachable claim to be you, since the memories, we may suppose, will be as vivid and as accurate in the one case as in the other. Suppose, too, that there is some risk attendant on the freezing scheme, some chance that there will be damage to one's faculties if even the briefest time lapses between dying and being refrigerated. If you could be assured that no such risk was incurred with the other scheme, that the being which took shape would find himself in as good a state of health as at the moment when the blueprint of you was drawn up, would it be so obvious that, even though you are seeking *your* immortality, you should not prefer the latter scheme? Simply to insist that it won't strictly be *you* that is around at the future date seems to represent a conclusive consideration against opting for the blueprint alternative, but it might also be regarded as no more than a legalistic fight over a word. The thawed-out individual wins the battle for the identification given with *you*, but what consequences does this have? There is more than an echo here of our discussion of object identity and reincarnation.

10

Space

The reality of time and the debate between the absolutist and the relationist have figured prominently in preceding chapters. The parallel issues, already touched upon, will be to the fore in our discussion of space. There are numerous symmetries, often noted, between spatial and temporal relations. Indeed, the two run parallel for such a distance, there is a presumption against any account which contradicts the symmetry. Certainly, the parallels are sufficiently pervasive for relations in the one domain to provide a check on, and a guide to discovering, relations in the other, the analogy which empty space offers to empty time being of particular interest. However, time offers no close parallel to the issues which arise with respect to geometry and space, and the considerations we shall be introducing here cover very different ground. Space, it is often said, is, or may be, curved. Curvature is not alien to absolutism concerning space, but it has no place in relationism. On this conception, we have to look to bodies and relations amongst them to account for the facts which spatial curvature was introduced to explain. That is the conception we shall continue to defend.

10.1 ABSOLUTE SPACE

The analogies between time and space might lead us to expect arguments for the unreality of space which mirror McTaggart's attempted proof of the unreality of time. So, just as the reality of the latter is held to require that events be the subject of the supposedly incompatible descriptions given by 'past', 'present', and 'future', so the reality of space may be thought compromised by the possibility of describing one and the same object or location as 'near' and 'far'. Once more, we might query the alleged inconsistency: standing on the edge of a desert, I can describe the desert as both near and, having regard to its distant areas, as remote or far. This parallels a characterization of a drought as past, present, and future. There is also the more familiar matter

of the differing vantage points from which something is distant or to which it is near. As with time, the argument in either case is one as to how such relativity is to be interpreted: can perspectival character support a denial of the reality of space? Can we speak of *facts* of relative location, of its *objectivity*, are we dealing with something that is mind-dependent? We have already expressed misgivings about a use of 'objective' which would refuse to accord objective status both to judgements involving the temporal indexicals, 'now' and 'then', and those involving the spatial indexicals, 'here' and 'there'. The rejection of factual status and the acceptance of mind-dependence are equally misguided.

As with time, two people who are divided over the reality of space are unlikely to be divided over an empirical issue. It is not like the question whether there is or is not a monster in Loch Ness. The issue is, rather, one of grammar, and it is accordingly appropriate to give a more thorough exposition of the kinds of thing which it makes sense to say about space, and hence to be able to judge whether, and in what sense, space might be said to be real or otherwise.

Those who would have it that space is simply nothing might surmise that 'space' enjoys a clausal role which could be called upon in sharpening their point: we can speak of measuring a space, but 'space', like 'distance', does not provide us with a genuine object. This analysis would be tempting for a relationist. Leibniz did not make use of our objectual/clausal division, but his *substance* has affinities with our *object*, and it is opposed by Leibniz to a relation. However, the comparison is not apt. In so far as we are concerned to distinguish objectual and clausal uses of terms, 'space' belongs with the former. The space between two buildings is as much an 'object' as are the buildings themselves, whether that space is empty, or partially or fully occupied—a matter in the last case of 'space' as equivalent to 'spatial extension'. There is the same shift in sense when we go from 'measuring the gap between the buildings' to 'measuring fifteen yards' or 'measuring the distance' as there is when we go to the latter from 'measuring the building'. The question of a parallel in this respect made for a difficulty with time, there being some inclination to see the possibilities of measurement as dividing between the objectual—measuring or timing an event—and the clausal—measuring the duration of an event, how long it took. However, the terms 'period' and 'interval' appear to be as much objectual as do, say, 'change' and 'event'. This comparison does not raise an insurmountable problem if we can say that measuring or calculating the length of a period is a matter of measuring or

calculating how long some event or series of events lasted over that period, 'A period of time has elapsed' being coextensive with 'Something has lasted for a period of time'. With this reduction we avoid any illegitimate reification of bare time as the object or quantity on which our measurements bear.

However, we had to face the question whether such a reduction was mandatory, and here a significant difference with space arises. To measure an interval between events *A* and *B*, or even just to ascertain that the two are temporally separated, we have to make use of a bridging change or changes, as might be provided by a clock. Spatial separation is comparable, in that we must make use of a ruler, light waves, or some other bridging means to establish such separation. But there is a difference, in that we can remove our measure and be confident that the spatial interval has been restored to its original empty state. There is not in the same way a recurrence of our temporal interval, but now without the changes which showed its reality. It is at best only indirect considerations that can be invoked: we have *A* and *B* shown to be separated by *n* seconds, and grounds for saying that *C* and *D* can be supposed to have the same temporal structure, whether or not anything happens between them. However, we shall see that theoretical considerations of the relevant kind can be resisted without coming up against an empirical refutation.

The parallel between space and time continues with the substantivalist or absolute conceptions of each. Absolutism with respect to the latter is defined by answers to two questions. First, and more important, can we conceive of the passage of time independently of there being any events in time? The absolutist's reply is Yes: time is a self-sufficient quantity or entity which could in principle antedate the existence of a physical universe and continue to flow after its demise. Espousal of this conception is sufficient for absolutism, but there is another strand, given with points or instants of time, the absolutist being prepared to accept their reality without the need for events in terms of which they may be defined.

Absolutism or substantivalism with respect to space embraces two parallel considerations, though here the issue concerning spatial points enjoys greater prominence. First, there is the question whether space could be independent of bodies to the point that it could be totally empty, as Newton believed. Second, there is the question whether space contains fixed points, points relative to which bodies can be said to move, so that we might make sense of the motion of a single body in otherwise empty space. So, for the absolutist, movement through space is thought of on the analogy of movement through

the countryside, say, where the moving body passes various landmarks on its way, only the landmarks are now imperceptible. It should be noted that while Newton's view is commonly characterized as 'substantivalism', the term 'absolutism' is to be preferred, given Newton's preparedness to contrast space and material substances with respect to the properties that each may have. However, if space is credited with the possibility of acting, as with the space-time of general relativity, then 'substantivalism' is appropriate, and the term need not be out of place if it is made clear that the less demanding condition of independence is what licenses its use (see Nerlich 1991: 170).

Application of the concept of a period of time requires points or markers which define limits of the period, points which will be given with termini of events or changes. Specifications of spatial distance will likewise require markers, and, just as with time it is not time itself that furnishes these, so space is not provided with differentiating points, points which might mark off its regions or stretches. A spatial distance is a distance between termini x and y, and x and y are not properties *of* space; space itself has nothing to offer here, but anything we might choose to advance in this capacity will be a feature of, or in some way depend on, something *in* space, something in the broad category of the physical. A space can exist unoccupied, but not without bodies that define its boundaries, and even if an interval of time may be empty of events, as an interval it requires events to mark its termini. Bodies and events are necessary to the *reality* of space and time.

But, it will be objected, there is surely a midpoint between the earth and the moon, even if it is unoccupied. The point must exist if anything is ever to be stationed there (cf. Dainton 2001: 143). And, we might add, there must be a line we cross when we cross the equator. There are indeed such a point and such a line, provided only that the relevant locations are definable, and the point could be identified by specifying suitable co-ordinates, even though there is nothing at present occupying the location. And, as noted above, we need not stop there: dispositions of points which might define a chiliagon, a Klein bottle, or a Möbius strip are likewise to be acknowledged. Points in this sense, points which are not 'delineated to sight', might well be styled 'fictions'; and, as every schoolchild is told, the equator is an *imaginary* line. 'Fictitious' and 'imaginary', not 'metaphysical', are the appropriate alternatives to 'concrete', and, as Frege observed, the character of the equator as imaginary is consistent with its being objective, just as with the centre of mass of the solar system (Frege 1980: §26). 'There' does not have to pick out an occupied setting, as with 'there, in the soup', just: where something could

be, as with '28 miles due west of the church'. What is important is that such a location can be given only by specifying its relation to a body or bodies. There is nothing adjoining the end of my finger, but I may use my finger to define a point in space, a point which will have much the same standing with respect to space as an instant has to time. In both cases we go wrong if we think of them as minute constituents of the physical universe which respectively sum to volumes of space or periods of time.

The absolutist's points are problematic in the extreme. If we think of them as three-dimensional, then they appear to belong with physical particles, particles which are in space rather than in any sense part of space, and which could meaningfully be said to move about and indeed be observed. On the other hand, to think of them as limiting cases or idealizations of such particles is to treat them as geometrical points, points which we can define or introduce in various ways—as, for instance, a point of intersection of two coplanar lines—where the mode of introduction does not have to answer to the location or reality of points already in some way given. If it is claimed that empty space already furnishes the necessary points, their undetectability or unknowability could plausibly be said to throw doubt on their actuality, but in so far as the points have simply the abstract character of co-ordinates, there is no further question of their existence, physical or metaphysical, knowable or unknowable. Character as abstract in no way tells against the admissibility of such points in space. It is just that they presuppose something in space that is not abstract. Otherwise, it is like saying that the position of a point is defined by $x = 7$ and $y = 12$ even in the absence of x and y axes. In this context, questions of existence become questions of definability, as when we wonder whether, in a world in which everything is in motion, it makes sense to speak of a point at which a body was last situated.

To justify talk of points on the grounds that they are legitimate theoretical entities is likely to be misconceived. If this is another way of describing character as a geometrical point, it is acceptable, or if it is another way of saying that there are no such entities at all, but it is useful to speak as if there were. Note that if the latter line is taken, there is no question of postulating such entities, since there is no difference between there really being such entities and things behaving as if there were. There is nothing corresponding to postulating a quark or a Higgs boson and then finding out that the postulate is vindicated. You do not have to postulate x if you can ascertain that x exists, but nor do you have to postulate x if x's existence can be affirmed on the basis of purely geometrical considerations.

Is the existence of points of a more substantive nature, as required by absolutism, shown in the way Kant (1768) thought it could be? Kant asks us to imagine a universe which contains nothing more than a single human hand. This hand must be either right or left, but in what does the difference between right hand and left hand consist? Not in the hand's relation to other bodies—there are none—nor in anything intrinsic to the hand: all the measurements we might make for the one would apply equally to the other; there are no differences in the distances, angles, or any other spatial relations to which we might appeal. All that remains, Kant concluded, is that the hands should be differently related to space itself, and that implies that space has its own points or structure which might stand in different relations to the hands.

Kant's observation that a right-hand glove will not fit a left hand confirms the fact that the two hands have different shapes. Or, rather, it does so for leather gloves, though not for rubber gloves, which may fit either hand. There are no more left-hand and right-hand rubber gloves than there are left-hand and right-hand teacups. And the relevant difference between gloves of the two kinds is clear: leather gloves have, while rubber gloves lack, a distinctive front and back, a front and back matched by the palm and the back of a hand. It is the front/back difference that stops the gloves being interchangeable, and likewise for hands. Whether the thumb is on the observer's left or right depends on the position of the observer *vis-à-vis* the hand, though whether the hand is a left hand or a right hand does not, a left hand being a hand with the thumb on the left when the palm is facing, a right hand being a hand with the thumb on the right when the palm is facing. If you rotate the right hand through 180 degrees, the thumb will, in relation to the observer, now be on the left side, but it will still be a right hand, as just characterized.

So, either we have an intrinsic property—defining left hand and right hand—or we judge from an observer's position, actual or hypothesized, in relation to the hand. With hands and leather gloves, handedness is an intrinsic property, whereas with rubber gloves we have left and right only in relation to an observer, or other body. Is handedness a spatial property? It depends on what you include among such properties. It is true that internal relations for distances and angles are the same for left and right hands, but we can plausibly say that, while being the same with respect to such relations, two bodies differ spatially if there is a difference in left-right orientation which is not eliminated by rotation. Left and right hands are, after all, different

in *shape*. Compare the analogous question with respect to time. Suppose we have a happening which goes from *A* to *B*, as a sound goes from loud to soft, and an otherwise identical happening, except that its direction is from *B* to *A*, from soft to loud. If our observations on temporal order are correct, this too gives us an intrinsic difference.

The important conclusion is that all that a relation which absolute space could afford would be one whereby from a point external to the thumb, the thumb could be to the left of that point, and from another point it could be on the right. This tells you nothing about the intrinsic character of a hand: it could give us left and right for hands attached to bodies, but would allow that what is thereby judged a left hand could be a right hand transplanted from a left wrist. Moreover, the points of absolute space could do no more than is provided by more abstract points as given by co-ordinates rather than by spatial occupants.

Our discussion of abstract points offered some clarification of relationism, but what was said here verges on the trivial. We meet a less trivial issue, and a more formidable challenge to relationism, when we consider the possibility of space lying beyond any bodies in the universe. This topic will be taken up at the end of the next section.

10.2 THE REALITY OF SPACE

So far, we have added little to our earlier discussion, but there is more to be said about *nothing*. Is space something or nothing? Consider the proposition, 'There is nothing between these two bodies'. This can be taken in two ways. First, it may have the implication that the bodies are touching: there is nothing, not even empty space, between them. Second, it may be meant that there are no other bodies, but just empty space, separating the bodies. The absolutist is sometimes represented as allowing, the relativist as disallowing, the latter interpretation, but the recognition of empty space is in no way contrary to relationism, unless it should be supposed that there are no bodies whatsoever. Measuring the temporal interval between events *A* and *B* is not timing anything; it is doing no more than let one's clock run. Likewise, measuring an empty space between two bodies is just a matter of seeing how many times one's rulers can be placed end to end over that space. Just as no temporal episode is being timed, so there is nothing we are putting our ruler against.

It was pointed out that of no past time can it be said, 'There might have been nothing then', since there would have been no *then*. For a similar reason, we can rule out 'There might have been nothing now'. Again, if someone says, 'There might have been nothing', we may ask 'Where?', but without any hope of an answer, if it is nothing *at all*. Nothingness—that is, there being nothing—could not consist in an absence of all bodies, all radiation; absent from *where*, absence from *what*? Someone might answer the question, 'Where is the universe?', with 'All around you', but while everything around us has its place, there is no place at or in which the whole universe is located, no space, we shall argue, which the annihilation of the universe would leave empty. Paul Teller imagines a believer in absolutism making this appeal to ostension: 'in the actual world I am *here*. In a Leibniz alternative world, say one with everything moved three metres eastward, I would be *there*' (1991: 367). It is not being imagined that a move three metres eastward from where I am now—in the garage—would place me elsewhere—on the drive. That is true, but true in the universe as it is. It has to be that the move would take me *there*, not to the drive, but to where the drive now is. But where is that? 'There' just means in this instance, 'on the drive'. Location is not given with anything other than garages, drives, and other physical bodies and features; it is nothing without these. Again, the universe is to move eastward; east of *what*? As just stated, it takes something *in* space, not space itself, to provide a point of reference.

In cosmological reflections, the model for understanding 'nothing' is usually given by the second, less comprehensive, interpretation noted for 'There is nothing between these two bodies'. 'Nothing' is thought of as denominating *something*, however impoverished; perhaps a region of space that has been stripped bare, but which we can imagine as restored to its original state by the return of its occupants. Or, perhaps, a region which has never been populated, but which awaits the arrival of a physical universe, a region which provides the setting into which a big bang explodes. Compare Daniel Dennett's claim that the material world performs 'a version of the ultimate bootstrapping trick, it creates itself *ex nihilo*, or at any rate out of something that is well-nigh indistinguishable from nothing at all' (1995: 184–5). 'Well-nigh indistinguishable from nothing at all' appears calculated to secure the advantages of 'nothing' in not itself demanding explanation, yet in having enough reality to account for the existence of the material world. When 'nothing' is assigned this cosmological role—which makes it very like the empty space which Newton took to be the receptacle in which

God placed the universe—the question at issue is commonly whether this space or void is stable or unstable, whether it provides an environment in which quantum fluctuations can result in the appearance of matter. It is then very much *something*, and something, we may add, which cannot be accounted for by what eventually takes place within it. Scientific attempts to explain the origins of the universe are often vitiated by their reliance upon this substantive presupposition.

A not uncommon claim is given with the following: 'It seems impossible that you could get something from nothing, but the fact that once there was nothing and now there is a universe is evident proof that you can' (Bryson 2003: 12). Compare Stephen Hawking: 'The inflation was also a good thing in that it produced all the contents of the universe quite literally out of nothing' (1993: 97). But 'nothing' does not designate a domain from which anything can be produced or generated, a domain in which anything has its origins. To say that the universe came from nothing is to say that it did not come from anything, that the notion of coming into being has no application in its regard. And, as noted, it is questionable whether we can even say, in any ordinary sense, that the universe began to exist.

It is important to recognize that the problem is not just one of making sense of something or other coming from nothing, but of the *universe* coming from nothing. There could be nothing at a certain point or in a certain region of space, and then something materializing there. That would be difficult, if not impossible, to account for, but it would be a matter of something coming from nothing at that point, not coming from anything *there*. There is a space in which entities may come and go, but the universe does not duplicate that situation, does not compare with what may happen within it. To take 'nothing' seriously is not to treat it as denoting a void, a setting empty of bodies but which might come to embrace them. To say there was nothing and then the universe came into being not only misconstrues *nothing* as a location for a subsequent universe, but it also makes unwarranted use of 'and then', which would require that there have been a time before there was anything at all. We can have 'and then' for a particle coming into being within the universe, but not for the universe itself. Indeed, allowing for the latter is one of absolutism's most serious failings, fostering the illusion that there is a spatio-temporal domain which serves as a setting for the universe itself, something in which it may come and go, just as the universe provides a setting in which bodies can appear and disappear.

But does not the general theory of relativity allow the existence of totally empty space-time? We may be tempted to respond: that does not mean that totally empty space-time is possible; only that, if anything rules it out, it is not general relativity. However, what is important is to decide what is going to count as there being something in space or space-time, a question that is particularly pressing at a submicroscopic level: when it is said that an atom consists largely of empty space, we should like to know how emptiness and non-emptiness are determined. So, we may or may not say that a space is empty if there is light or gravitational waves passing through it, and we have to devise criteria for saying that a field permeates space. These are conceptual issues, but I do not think that logic extends to ruling out the very possibility of (an) empty space. Rather, having decided what is to count as something in space, it is then an empirical issue whether a space is empty or not. What is hard to fathom is the claim that space is totally empty and yet that that emptiness coexists with such properties as that of curvature, which is referred to space itself and not to something within space. We should, I suggest, resist a reification of space-time points along absolutist lines, such points being heir to the objections against purely spatial and purely temporal points as conceived of by the absolutist.

Harking back to our discussion in the previous chapter, we noted that the question why there is something rather than nothing can be answered if we can establish that there had to be something or other, and this is a weaker condition than is given with the theist's claim that there is something, some particular being, which has to be. However, the theist could contend that the only grounds we could have for the former are to be found with the latter. There has to be something because there is a being, God, who has to exist, who bears the reason for his existence within himself. The idea of necessary existence has been subject to much criticism, criticism which I do not wish to endorse, but in arguing for the coherence of necessary existence we find reason to suppose that the weaker condition is the more fundamental. 'God necessarily exists' can be paraphrased as 'There is necessarily a divine being'. This statement shifts the matter of necessity to the instantiation of a concept—'Something is necessarily divine'—rather than to one concerning an individual's possession of an attribute. It compares with 'In a population of people of different ages, there is necessarily someone older than the average.' The necessity is the necessity of the implication, not of what is implied. If, in a group of people, one person is smaller than the average in that group, then there must be another person who is taller than the average. If this is

the pattern for understanding 'God necessarily exists', we are not saying of some individual that he necessarily exists, that existence is of his essence; it is just that it must fall to some individual or other to be divine. And, just as a domain of people is presupposed in this example, so a non-empty domain in the broadest sense is presupposed with the theological proposition. Hence the more fundamental status of the weaker condition.

But this does not show that there is not some individual whose nature it is to exist. That is true, and it is also true that we go some way to conceding that we have such necessity. Our claim is that there being nothing whatsoever is not conceivable, and this may be joined by the plausible thesis that, if there is anything at all, there is a material universe, other candidates—the mental and the abstract—presupposing such a domain (see Rundle 2004). It follows that it is a necessary truth that there is a material universe, but not that *this* universe had to exist. Something material must exist, but not 'There is something material which had to exist'. On the other hand, the real challenge is to explain, in terms more specific than 'material' or 'physical', why the actual universe is as it is. We can make some progress towards meeting this challenge if we can argue that the present state of the universe has evolved from earlier states, and also that this does not take us to an initial state which would call for an explanation of a different order. The first task is up to science, and not beyond its powers; the second is philosophical, and far from straightforward. How might it be tackled? One possibility is that the problem posed by an initial state does not arise, any more than does the question of how the universe was brought into being, both being illustrations of the point that much of what we say about what goes on within the universe has no application to the universe itself.

That space is not nothing is apparent from such phrases as 'a large space', 'several spaces', 'the depths of space', 'travel through space', 'take up space', 'make space for something', and so forth. And it is the subject of properties, being a poor conductor of electricity, being continuous, measurable, and isotropic. So, 'Space is a poor conductor of electricity' is *contradicted* by 'Nothing is a poor conductor of electricity'. Note, too, that imagining nothing is not like imagining an empty space. It is not imagining anything, so not imagining at all. Again, there can be varying amounts of space, but not varying amounts of nothing. That would at best be a matter of regions, varying in size, in which there is nothing, i.e., no body, and with *regions* we are back to *regions of space*. Space is not a mere abstraction: a body can be literally in space. To produce or generate nothing is not to produce or generate anything,

but generating a space, as when we pull a body apart, does not reduce to such inaction. The constraints on space are also of consequence. It separates only certain kinds of thing, notably bodies, to which it is complementary, making it possible to speak of a limit to a body. There are no spaces keeping apart ideas, mistakes, moods, and so forth. 'Nothing' is much less specific. This makes it easier to see how space is something, how it is a part of the physical world, and how it has to be taken with the latter, as when we think of spaces as being brought about by the removal of bodies. But while space is not nothing, it is inert, not a bearer of energy, an agent of change, properties whose lack appears to have led Newton to deny it standing as a substance, even if, in his eyes, it possesses the independence enjoyed by its occupants.

Imagine someone trying to play down the reality of space by pointing out that we can create a space simply by parting our lips or our hair. But it is not that it is always easy to make a space, whereas it is difficult to create matter. True, we do not have to find something *out of* which space is generated, but it can be difficult to create a space if it is difficult to find the forces necessary to pull matter apart, for instance. What should be said is that 'create' means something different in the two contexts, as indeed does 'destroy' as used with respect to bodies, on the one hand, and, on the other hand, with respect to the 'destruction' or elimination of a space which ensues when the space is filled.

The space between the sun and the earth is real enough; that just means that there really is a space between them. Or, if you like, they really are spaced: the reality of space is the reality of such spacings, of spatial separation. To the extent that we cannot get away from these simple paraphrases, we cannot get away from the reality of space. However, any notion of individuation is to be contributed by bodies. That is, notions of the same space or a different space make sense only in virtue of a relation to bodies, as when the space between our house and our neighbours is the same as the space between your house and your neighbours. 'Qualitatively' the same would be when it is a matter of 'same size', so corresponds to 'same height' or 'same colour'. In this use, a question of numerical identity does not arise. On the other hand, they are different spaces just in so far as they are the spaces between different bodies—yours can be filled while mine remains empty. This is the relevant notion when we are *counting* spaces. Space can inherit, have annexed to it, both the individuating properties of matter—those associated with numerical identity—and qualitative features, akin to dimensions. It thus mirrors matter.

Not only is space dependent on matter for its existence, but others of its features may also flow from its dependence. Three-dimensionality is often instanced as a feature of space, but if this is as much as allowed, it is surely because of a reliance upon objects, possible or actual. Possession of this feature by objects is straightforward, but if we delineate a three-dimensional structure by tracing out appropriate lines between bodies, does this show that space itself has three dimensions? It tells us something about the dimensionality of objects which might occupy space, but by way of saying what 'Space is three-dimensional' *means*. Would space have more individuality if it were not true that any two objects in space were in the same space, if somehow there were no path from space s_1 to space s_2? But the spaces in question would still have to be identified in terms of the objects in them. It would be a matter of there being no way of linking up *objects* in the spaces which each identified.

We do not expect objects put into an empty cupboard to alter just as a result of their relocation, and this indifference to location would appear to continue if the space is now extended to embrace the whole of the cosmos. If, as in Newton's scheme, space were a vast pre-existing container into which bodies were placed, it would seem that the bodies would owe less to their spatial setting than if space had been born along with, or out of, bodies, being never ahead, as it were, of such happenings. If, on the other hand, there is this dependence, we might expect to find that space is in some sense a 'function' of matter, is intimately related to matter in how it behaves, and in how things behave in it. Spatial separation might then make for a weakening of relations binding matter rather than their annihilation, a binding force being attenuated as one body is drawn away from another. Or again, any tearing apart of matter is never complete, though not because *particles* will always persist across an intervening space.

Imagine that we move out into space beyond our galaxy. However far we venture, we remain in motion relative to the world left behind. Suppose now that that world, along with all else—we and our craft excluded—is extinguished. It is then tempting to think of that occurrence as powerless to affect our motion. After all, what does 'affect one's motion' mean, if not divert, accelerate, or bring it to an end, and how can the disappearance of a body accomplish that? Surely we simply carry on untouched by the events behind us? However, the destruction of the bulk of the universe's matter may not affect the motion of what remains, but it can have repercussions on what is possible by way of *description*. We are not talking of causal conditions of motion—not of a real change, but of a mere Cambridge change. The annihilation of all

other bodies does not bring the one remaining body to a halt—a causal notion. That would be a bad way of expressing a grammatical proposition (about the lack of what is needed for talk of movement, or indeed rest, to have application), when it makes for the removal of a necessary condition for very talk of motion, or indeed rest—*contra* Clarke, in Alexander 1956: 32. Compare the claim that space is needed to keep bodies apart. That is true, but by way of giving a logical condition, not a causal one: space is needed if we are to be able to speak of objects as being apart, but it is not the instrument of their separation. Note that if the universe is reduced to just one body, there is no question of its moving through space, so no puzzle about what we might encounter if it moved far enough. It is as with the universe as it actually is, when there is no question of a change of spatial co-ordinates for the whole.

We noted that destruction and elimination mean something different when applied to an occupant of space and to space itself. In similar vein, if, in a universe containing a single body, destruction of that body resulted in the destruction of space, this would not be *physical* destruction. If there is now no space, it will be because something which enabled us to make sense of space will have been taken away. It is not that when the body vanishes, it leaves a certain space empty. When the last space occupant goes, space goes—logically—with it. Even while the isolated body remains, can we speak of *positions* in space? It might be said that if the body is in space, it is *ipso facto* at some position in space, but what can that mean if it is only the presence of the body that affords talk of a position? Space does not itself have any positions. When we imagine an empty space we imagine it from a perspective, and positions in space are given only with bodies. It is not as if one could measure in from the edge of space and assign co-ordinates. So, imagining a sphere to come into existence is not imagining it to come into existence at one point rather than another—as though we might say: it came into being there, but it might have appeared some yards to the left. When we imagine empty space, we imagine it from a certain perspective, one in terms of which we can make sense of left and right, say. But what we are imagining is a body, probably our own, with a left and a right side. There is nothing in space to which left and right can be transferred.

That we have a choice as to which bodies we deem to be at rest, which in motion, appears to be part and parcel of the relational view of space. This calls for examination. If one object, *A*, is *caused* to move relative to an object *B* which has no causes impressed upon it, we very naturally favour *A* over *B* as the object to be described as in motion. The causation makes for an

asymmetry which precludes the alternative description of *B* as moving and *A* as at rest, which taking motion to be just a change in relative distance between the two allows. This asymmetry led Leibniz to make a seemingly damaging concession to Newton in the debate concerning absolute space. He wrote:

> However, I grant there is a difference between an absolute true motion of a body, and a mere relative change of its situation with respect to another body. For when the immediate cause of the change is in the body, that body is truly in motion; and then the situation of other bodies, with respect to it, will be changed consequently, though the cause of that change be not in them.
>
> (Alexander 1956: 74)

Taking motion to be a change in relative distance between two bodies allows us to denominate either body as a body at rest, but we can supplement this characterization by a stipulation as to which body is to be deemed at rest. We need not follow Leibniz in requiring that the cause of movement should be within the body that is deemed to move, only that some cause can be found to operate. If, following this stipulation, a body is said to be at rest, this will be so only with respect to the object which moves, not with respect to absolute space, so there is no concession to the Newtonian conception. And what of Newton's rotating bucket (1999: 412–13)? Mach suggested that it was rotation with respect to the fixed stars which causes the depression of the water in a rotating pail. Broad writes: 'Mach's answer accepts the view that the flattening of the earth and the depression of the water depend on motion relative to the *fixed stars*, and that therefore the existence of these bodies is an essential factor in the causation of such phenomena' (1923: 108). But the fixed stars are invoked to give sense or substance to the notion of rotation. Someone might object that their remoteness disqualified them as causes, but the question is whether their remoteness deprives them of the role of providing fixed points with reference to which the rotation of our pail may be defined. Broad is aware of the distinction, but discerns an inconsistency in the relationist's attempt to use the fixed stars 'as *mere* axes of reference, and in no sense causal factors' (1923: 105).

Leibniz's concession need not make for a rejection of the relational account of motion, unless it is claimed that a body might be said to move as a result of causes within even though no other bodies existed. Likely instances of motion thus caused would involve acceleration, which is thought relevantly different from uniform motion. However, if the latter cannot occur in the

absence of other bodies, it would appear that the same holds for accelerated movement, and that for the same reason. Acceleration is defined as the rate of change of velocity, so if velocity is ruled out, so too is acceleration. As with rotation, effects of putative acceleration have to be redescribed.

We have said enough to show that 'space' does not equate to 'nothing', and we have indicated how positions in space, along with others of its features, are dependent on bodies, as the relationist maintains. But we have not demonstrated with any finality that space without bodies is impossible, nor have we said anything about the possible infinitude of space. I now wish to introduce an argument which, while pleasingly simple, offers illumination on these matters.

The argument may be approached in the following way. Imagine that a spacecraft leaves the earth, the solar system, our galaxy, travelling out indefinitely into empty space, never encountering another body. However, instead of giving this description—with the consequent question of what is the extent of the space into which the craft is moving—we may say that the space between the spacecraft and the earth is constantly increasing, treating the craft as if it were at rest. Compare time. A natural thought is that we have a moving present, that we are constantly advancing into the future. But this is wrong if it implies that there are times awaiting us; it is, rather, that the interval between the present and past happenings is constantly lengthening.

But if we may choose to depict the spacecraft's journey in the terms suggested, we can also, surely, speak in the more natural way, which would have it that the craft is moving further out into unoccupied regions of space. There will still be, it would appear, a space into which it moves. Think of the craft as at rest, if you wish, but if a probe is extended out from its front, that probe will certainly move, and, supposing that nothing impedes the motion, where can the probe be advancing if not into unoccupied space? This reasoning may look irresistible, but we should challenge the claim that it requires space beyond the rocket if the probe is to be extended. The crucial question is: why, in this context, should 'There must be space' be preferred to 'There may be nothing'? We have been concerned to argue for the reality of space; in particular, space is demanded if we have spatial separation—empty space to be traversed if we are to reach a body further away from the rocket. Indeed, it appeared correct to say that the reality of space is the reality of such separation. Our simple argument now runs: if there is no such role for which space is required, then we are without a reason for saying that there is space beyond the rocket, rather than simply nothing.

The claim is not that you can on no account speak of 'space'; it is, rather, that in this context you can equally speak of 'nothing'. We are drawn to thinking of gazing out at the heavens as gazing out at nothing, where no body is in view but where, thanks to the radiation which permeates space, we see the blue of the sky. But taking 'nothing' literally requires us to reject even this minimal spatial interpretation. To generate space a suitably positioned object is required—something flying out ahead of the spacecraft, for instance. It might still be insisted that there must be empty space for the object to move into, but it is not that there must be a special setting to receive the object, only that there should be nothing which would inhibit its movement. And if there simply is nothing beyond the craft, that condition is, of course, satisfied. A denial of the infinitude of space does not mean that at some point we shall come up against a barrier. The boundaries of space are given with the furthermost bodies, but an object can still pass beyond these. Once more, when a space is created between the craft and an object preceding from it, this is not like creating matter. It is just that the conditions for speaking of a space have been met where before we had literally nothing (see Le Poidevin 2003: 93–4).

This argument has important consequences. As Russell might have put it: 'This is a most lucid observation, by which a host of confusions are routed.' First, in so far as 'space' does not reduce to 'nothing', it has application only if there is more than one body. If it does so reduce, you would have nothing empty and nothing occupied. There is accordingly no such thing as totally empty space. We think we can imagine all the matter in the universe ceasing to be and leaving just a boundless empty space, a space which might eventually be repopulated. But if such a space is not allowed, the most we could have is two universes with no links, spatial or temporal, between them. It would make no sense to say that one universe was a continuation of, or even that it succeeded or preceded, the other. Second, if there were space beyond the limits of the physical world, we could ask whether it was bounded or unbounded, but if there is literally nothing beyond, there is nothing to which either 'bounded' or 'unbounded' applies. Third, the challenge to relationism is not given by the possibility of totally empty space between bodies, but bodies provide a framework in which points of space, however abstract, may be defined. It is the possibility of empty, unbounded space, not empty spaces, that would defeat relationism, and this is not a possibility we have to recognize. Four, and following on from this, we can allow that the universe may expand indefinitely, but this will

make for an expansion *of* space; it will not be an expansion *into* space. The outermost galaxies are not drawing nearer to anything which they might eventually pass and leave behind; so, not a movement out into space, but any movement is to be found by looking back to increasing distances between the galaxies. Since no space is to be found beyond the outermost galaxies, the question of the extent of space will be decided by having regard to relations amongst bodies in the universe: space is finite if the number of bodies is finite and if there is no body at more than a finite distance from any other body, where 'body' extends to the photons in electromagnetic radiation. So, by this criterion, is space finite or infinite? Finite, surely, at least as far as the second condition is concerned. Whether there could be infinitely many bodies will be briefly considered at the end of the next chapter, but if you had two bodies infinitely far apart, you (logically) could not reach the one from the other, so what reason could you have for saying they were in the same universe? On the other hand, there is still room for a notion of infinite space in so far as a body is not impeded from advancing indefinitely. Space is then infinite in that it is indefinitely extendable. In this, perhaps unexpectedly, space is like time. Future days may be potentially infinite in number, but not actually so. With space, by contrast, we more readily accept the possibility of an actual infinite—space infinitely extended rather than continually growing in extent. However, our argument shows time and space to be on a par, both, if infinite, only potentially so. With this characterization of finitude, we have no need to consider whether any sufficiently prolonged journey away from our galaxy would have us eventually returning to it. Given the way our alternative avoids questions concerning the curvature of space, it has much to recommend it. We shall turn to these questions shortly.

10.3 SPACE AND CURVATURE

We have allowed that space has various properties, but its dependence on bodies may lead us to conjecture that talk of such properties will resolve into talk about properties and relations of bodies. Is this how it is with respect to the possible curvature of space? While a substantivalist may be happy to ascribe structure to space, the relationist could be expected to regard his programme as fatally flawed if he is unable to ground any structural properties, such as curvature, on occupants of space, perhaps in conjunction

with possible forces. We shall approach this question via a consideration of the relation between geometry and space.

Our introduction to non-Euclidean geometry is likely to leave us incredulous, or at least bewildered. Anyone with any grasp of the concepts of Euclidean geometry will surely consider its postulates and theorems to be as incontrovertible as the multiplication tables. How can there be a real alternative in the sense of an alternative that contradicts Euclid? Let *E* be the proposition: the angles of a triangle add up to 180 degrees. It is sometimes said that the parallel postulate, which is equivalent to *E*, is 'less self-evident' than any of the others in Euclid's *Elements*, but it would still appear to be self-evident. How could there be more than one line through a given point in a given plane parallel to a given line? How could there not be at least one such line? To deny the parallel postulate would appear to be about as plausible as denying that the distance from *A* to *B* is the same as the distance from *B* to *A*. There are differences between the various postulates, some being more by way of licences to perform certain operations rather than propositions, true or false—as when it is said that we may describe a circle with any centre and radius. However, when propositional forms are in question, I should have thought that the parallel postulate stood up well as far as our ready assent is concerned, and if that assent is not misplaced, there must be readings of key terms, such as 'straight', in terms of which the postulate, or *E*, is true. It may not be Euclid's definition—his characterization of a straight line as 'a line which lies even with the points on itself' has not been found helpful—but we should expect some suitable definition to be possible.

Attempts at weakening the grip which the parallel postulate has upon us are sometimes made by inviting us to consider its failure with lines on the surface of a sphere, where a straight line is defined as a 'great circle', that is, a circle with its centre and radius the same as the sphere's. Clearly, no two great circles are parallel. However, even if we go along with this definition we may feel cheated. We had not been thinking of lines on any such surface, and the extension of Euclidean geometry to cover such constructions does not mean we have to abandon the necessity of the postulate in its intended domain of application. Very well, but forget spheres, and look just at lines rather than lines plus surfaces. If, as seems reasonable, we continue to define a straight line as the shortest distance between two points, might we not find that joining up three points by lines straight by this criterion resulted in a triangle whose angles did not add up to 180 degrees?

Suppose that a straight line, understood in this way, is identified with the line of sight. Suppose, too, that the angles of a triangle which links up three spatial points, with light rays as its sides, do not add up to 180 degrees. What are we to say? For someone happy with the idea of a non-Euclidean triangle, *E* may have the standing of a proposition to be tested in the particular case, but could it not also be regarded as a proposition with which to test? Much as, it might be said, a proposition of arithmetic, as '15 + 25 = 40'. Should someone count a group of 25 objects augmented by a further 15 and reach a total other than 40, we shall say that he must have miscounted, or that the objects in some way increased or decreased in number on being counted. In either case the testing proposition will show some *empirical* proposition not to be so; so long as ancillary propositions are being held to be non-empirical, they will not be allowed to fail. So, in the geometrical case, it may be said that the angles were measured incorrectly, or the check on the straightness of the lines misperformed. This, we may note, brings out the role of grammatical propositions in linking empirical ones.

Suppose that our triangle is found to have angles measuring 40 degrees, 25 degrees, and 110 degrees. This may be taken as a reason for invoking a non-Euclidean geometry rather than for finding fault with the equation, $40 + 25 + 110 = 175$. Is it right to discriminate in favour of arithmetic over geometry in this way? I suggest that we can go so far as to say that our understanding of both arithmetical and geometrical propositions is such that we may regard them as having the status of rules for testing, but we are not to take them as propositions to be empirically tested. The only testing which Euclid's *Elements* allows is one which focuses on the consistency and completeness of the axioms and theorems. Until the geometry is applied, there is no question of a real alternative in the sense of one that may contradict Euclid (see also Bradley 1964 and Hunter 1980). But this is not to say that Euclidean geometry is privileged in this respect. Kant was right to regard Euclidean geometry as an a priori deductive system, but then so too are the geometries of Lobachevsky and Riemann.

An arithmetical truth might be considered in some way inapplicable. This would be unproblematically the verdict if things counted kept coalescing, as with drops of water, or if for some other reason amalgamating one collection of *n* objects with another of *m* resulted in a collection having more or less than $n + m$ members. But these are cases where the objects counted interact, or when counting is a matter of operating on objects. It is difficult to see how more abstract instances of counting, where nothing is *done* to what is

counted, could offer scope for such a departure from the usual sum, a sum which is presupposed when we speak of a collection as having more or less than $n + m$ members. On the other hand, if an arithmetical proposition is accorded a non-experimental status, that can be because it may be used as a check on whether a pure calculation has been performed correctly; it need not be a check on the orderly behaviour of things counted. Moreover, there is such a thing as checking whether a calculation has been performed correctly which is independent of a comparison with the correct result. Indeed, this is not only the usual case, but the notion of performing a calculation correctly has to be given priority over that of a correct result. At all events, if the angles of our triangle are 40 degrees, 25 degrees, and 110 degrees respectively, then there is no alternative to calculating the sum as 175 degrees. Nor does it make any difference in what order we add them. Unlike the addition of water and sodium hydroxide, the result will be the same: adding water to sodium hydroxide yields a different result from adding sodium hydroxide to water. There may be cases where the usual arithmetic lets us down through being inapplicable, but not through being incorrect. But, then, is this not also the right way of describing results at odds with Euclidean geometry? For the familiar reasons, that geometry may not apply, but that is not to say that any of its theorems are false. Their truth derives from the consideration that they are true to our notions of being a plane triangle, being parallel to another line, and so forth.

A different position is advanced by Henri Poincaré:

> In other words, *the axioms of geometry* (I do not speak of those of arithmetic) *are only definitions in disguise*. What, then, are we to think of the question: Is Euclidean geometry true? It has no meaning. We might as well ask if the metric system is true, and if the old weights and measures are false; if Cartesian co-ordinates are true and polar co-ordinates false. One geometry cannot be more true than another; it can only be more convenient.
>
> (Poincaré 1952: 50)

Whether or not we regard geometrical axioms as definitions in disguise, there is still room for true and false with respect to putative theorems, alongside descriptions of geometries as more or less convenient. More or less convenient—that is, more or less applicable—but not more true than theorems of another geometry.

May we conclude that the lines of our anomalous triangle are curved? That is a possibility, but it may be that, on the given characterization, the lines just *are* straight. That is an empirical proposition which may be supported

beyond reasonable doubt. Still, could not our proposition *E* be taken as a criterion of straightness? A straight line is a line such that, if three of them join three points in a triangle, the interior angles of the triangle will add up to 180 degrees. That stance can be maintained, but the eventual conclusion could be that there are no straight lines, at least over certain distances, and hence that Euclidean geometry is simply not universally applicable. It was suggested that denying the parallel postulate was no more plausible than denying that the distance from *A* to *B* is the same as the distance from *B* to *A*. That comparison is not wide of the mark. It could easily be that there were one-way traffic systems which meant that the distance from Oxford to Cambridge was greater than the distance from Cambridge to Oxford. True, it might be retorted, but there remains a route—the distance as the crow flies—which is the same in each direction. Very well, but it could also be true that that route had no physical realization. Whether that is so is for experience, and physical theory, to decide.

We could continue to maintain that a necessary condition for a figure's being a triangle is that the sum of its interior angles should be equal to two right angles, and this would remain invulnerable to empirical findings, but we should still have to devise a geometry to handle figures with three sides, straight by our operational definition, which summed to something other than 180 degrees. We do not have to say that Euclidean geometry is contradicted by non-Euclidean forms, since we could so use the terms that 'The interior angles of a triangle add up to 180 degrees' is a true statement in Euclidean geometry, but 'The interior angles of a triangle add up to less than 180 degrees' is a true statement in Lobachevskian geometry. One might well resist qualifications of 'true' of the form 'true in *S*', where *S* is some language or mathematical system. Surely, a proposition is simply true, or not. It is not that a proposition is true in *S*, but that a proposition in *S* is true. Still, it may be that the question of the truth of *P* comes down to the question of whether or not *P* can be derived in some system. This would give point to the form 'true in *S*', which would become even more apt if the same form of words, *P*, could occur in other systems, and possibly not be derivable therein.

Contradiction is not to be avoided by saying that the non-Euclidean geometries are geometries of figures on curved surfaces, so predictably different from a Euclidean standpoint. The sides of the relevant triangles are being supposed to be straight, not curved, according to our definitions, though it is true that, while 'curved' may be a misnomer, a geometry which treats straight lines as curved may give the right results. The point of

importance is the following. It is one thing simply to suppose that light rays curve, in a normal sense. By 'in a normal sense' I mean that a standard of straightness is available which provides us with a contrast to the paths taken by the rays. So, we shine a light from one point to another and compare the path which it traces with a path between the points which is determined in some other way, and for whose straightness *E* provides confirmation. It is another matter altogether to suppose that *no* way of joining up the points results in a line shorter than the ray which failed the test given by *E*. We have now lost the contrast which enabled us to say of the ray that it was curved, not straight, when set against the other path. The model given with the surface of a sphere fails, is no more than a heuristic aid, precisely because we know well enough how to specify a shorter route between two points. It is true that we are not allowing ourselves to take underground shortcuts, but the possibility is there to give sense to the notion of curved as opposed to straight, and we do not want to secure 'curved rather than straight' by ignoring a procedure which would establish straightness.

It seems that we could be in a position to say that the geometry which applied to our world was non-Euclidean. Might it follow from that that space was curved? First, one of our main points has been that 'curved' may not be a correct description of the sides of a non-Euclidean triangle. When we apply geometry, whether Euclidean or non-Euclidean, we consider only sides that conform to our definition of straightness. That should be an end of the matter, but suppose, perhaps for other reasons, it is insisted that space is, or at least could be, curved. Is this a possibility we must take into account? I should say not. 'Space' is surely no more a fitting subject for 'curved' than it is for other specifications of shape, as 'triangular', 'crooked' or 'jagged'. True, given that we have no idea what it would mean to speak of space as 'curved', this is perhaps why, paradoxically, some are prepared to accept that it is. That is, not knowing what it would be for space to be curved, we are at least not in a position to say that it is not. And there is, with some licence, an obvious rendering: 'Space is curved' can be taken as 'Bodies follow curved trajectories in space'. But, it may be objected, that rendering does not do justice to the explanatory contribution of space's curvature. Go back to the explanation of the universe as finite but unbounded. It is surely the character of space as curved that explains why, on venturing out into space, we do not eventually encounter a barrier marking its limits. But you do not explain the phenomena by saying that space is curved; as I say, 'Bodies follow curved trajectories in space' is, on the present proposal, what space's being curved *means*.

How, after all, might space's being curved have any effect on the way bodies travel? It is not the connection you get when a vehicle follows the contours of a race track, not a matter of lines or seams which, however mysteriously, make their presence felt to the bodies whose trajectories they govern. The picture appears to be one of travelling along rails laid out in advance and, while the rails are thought of as reduced to the point of idealizations, they are there none the less—much as in Newton's conception. And suppose that there is in fact no empty space, but the space between bodies is pervaded by a ubiquitous gas. Is it the gas that is curved? But if it should be constantly swirling about, the gas fails as a suitable subject. Or are there points and lines of space mixed up in the gas? It is because such points and lines do not compete for space occupancy with particles, or whatever, that they have no concrete reality. If you do not allow the curvature of space to explain the trajectories of moving bodies, are you not obliged to postulate special forces? But, to bring together two preceding observations, curvature of space is not to be granted, let alone invoked in explanation of the direction of movement, and we are not obliged to allow that bodies whose movements accord with non-Euclidean geometry do deviate from a straight line when no forces are applied.

Axioms and theorems in geometry do not describe a form of space, but relations between such things as light rays which correspond to geometrical lines. It is highly misleading to speak of Euclidean or non-Euclidean space. Space does not have its own lines somehow inscribed within it—any more than it contains all Newton's geometrical figures—but if we speak of a line between two spatial points we can be asked to specify what constitutes that line: is it a series of rods, a light ray, the path traversed by a body moving without interference of any kind, that is, moving inertially? And we do not know a priori whether or how such differently determined lines will behave. We have introduced an *empirical* factor which it is for experience to determine.

In discussing the direction of time we claimed that we must look to happenings in time, rather than to time itself, to find a direction, an order of precedence. Of course, times themselves are ordered—11.00 p.m. comes before midnight—but their order is derivative upon that of events. The same holds for space. The question is sometimes raised whether space is anisotropic, having a unique direction or orientation, or whether it is the same in all directions. What holds for dimensionality holds for directionality: both are to be referred to things in space. And again with other aspects of

putative spatial structure, as being curved. The relationist appears to triumph at every turn.

Physicists may use causal verbs in formulating the relation between bodies and space, as when it is said that a massive body will deform the space around it. This seems wrong: space is not something that might be acted upon, nor is it something in which the supposed effect, as being curved, could be induced (cf. DiSalle 1995; Dainton 2001: 294; Brown 2005: 140–3). The advantages gained by eschewing action at a distance have surely been thrown away if it turns out that, while the sun does not act gravitationally on the earth, it has to be allowed that it acts upon the space through which the earth moves. In the first case, we had with the earth at least something that, unlike space, *could* be acted upon. Should our picture be one of a body extending into the space around it? The body does not end where the immediate space begins but the latter is an integral adjunct to the body rather than an independent item which the body acts upon, and there is no problem of action at a distance, but our extended body can be said to be wherever its influence is felt. The physicist John Wheeler famously observed: 'Matter tells space how to curve; space tells matter how to move' (Misner et al. 1973: 5). In unpacking this metaphor we arrive in the first instance at a functional relationship; where we move on from there is not clear.

11

Time and Change

We have shed some light on the notion of temporal precedence, crucial to the relationist's conception of time as the order of succession of events, and we can handle the challenge to that conception posed by the notion of equal temporal intervals. We can also interpret the notions of *x* being simultaneous with *y* and *x* outlasting *y* in a relationist framework, and give an account of instants or moments within that scheme. To measure a period of time is not to measure pure time, we have suggested, but to measure the duration of a change or series of changes, and for time to elapse is for a change or series of changes to take place. Those who resist the idea of the passage of time can, with some charity, be taken as insisting that there is no more to time's passage than is given with change, no independence thereof. Changes—and not times themselves—are the reality which temporal concepts are introduced to order and compare. In Mach's words: 'For the natural inquirer, determinations of time are merely abbreviated statements of the dependence of one event upon another, and nothing more' (1898: 204). But suppose we have a period during which nothing whatsoever happens. There will be no question of directly measuring the length of that period, the use of a clock contradicting the supposed absence of change, but could not time elapse none the less? This is the point at which we left the issue in Chapter 7. Grant the possibility of temporal passage in such circumstances and we have to acknowledge a feature of time which threatens to defeat the relationist and favour the absolutist.

11.1 CHANGE AND PERSISTENCE

The need for change is particularly evident if a metrical conception of time is to have application, so if 'time' is properly used only as linked to that conception, time without change is impossible. This would, I have suggested, involve an unduly restrictive usage of 'time', but it may be that

issues concerning time and change take on a different complexion depending on whether metrical or non-metrical conceptions are in play. Could it be different to the point that change takes second place to the notion of a temporally extended reality, a reality which change serves to render amenable to measurement but which may exist without that refinement? Recall the passage from Newton which endorses this possibility: 'The duration or perseverance of the existence of things is the same, whether their motions are rapid or slow or null' (1999: 410). The question is not without importance for an understanding of what is possible for our universe. Suppose it is said: 'Imagine a universe that has never known change and suppose that some event eventually comes about.' *Never* known change, *eventually* comes about? Isn't that 'at no time' and 'after some time', so are we not presupposing the possibility of time without change? If this is impossible, then a first event would have to mark the very beginning of the universe—supposing, that is, we can speak here of a beginning.

Without further qualification, the claim that time comes inescapably with change is too general, since change can also be a matter of variation in space or place: the countryside changes as you get nearer the coast, the sky changes towards the horizon, the climate changes as you go further inland. Each of space and time makes change possible through making room for a difference within sameness. That is, we have contradictory predicates, as 'wide' and 'narrow', which can be consistently affirmed with respect to the same thing at different times, or with respect to spatially different aspects of the same thing—we speak of a change from flat to hilly or from wet to dry, rather than a change from flat to dry or from hilly to wet. With many features both kinds of change—temporal and spatial—are possible. So, the depth of the pool changes as the water flows in—a temporal change—but the depth may also change as you go from one end of the pool to the other. In either case it is the conflicting character of the predicates that forces us to find a difference—then as opposed to now, there as opposed to here—a difference which allows us to affirm the predicates of a single subject without inconsistency. A temporal dimension is demanded if we are to ascribe to an object or event phases which cannot occur conjointly, time thus featuring as a dimension in which such differences may be reconciled. These observations do not, of course, suffice to capture our concept of time, since they have nothing to say about the ordering given with '*x* is earlier than *y*', which is needed to supplement an account of what entitles us to accept a plurality of times.

There is an objection to this procedure due to Kant (1770: 394), namely, that time is needed if our ascription of contradictory predicates is going to be inconsistent, since the predicates will have to be intended to hold at the same time. This is true, but we can still say that differences in time are needed if contradiction is to be avoided, even if we can also say that sameness of time is required for inconsistency.

It might plausibly be argued that material existence is inseparable from time. 'Suppose a molecule exists' just *is* 'Suppose a molecule exists for a time'. Whether macroscopic or microscopic, physical objects, we might insist, are extended in time as inexorably as they are extended in space; the universe is one in which being, or being *F*, is a matter of continuing to be, or to be *F*. What, after all, is the alternative? A physical object might exist for the briefest of moments, but the briefest of moments still takes time. True, there is a notion of instantaneousness that has application in the physical world, most notably with respect to changes which constitute the coming to be or cessation of a state, as when an object begins to cool down or ceases to be upright. *Ceasing to be F* is what Ryle would describe as an 'achievement', a happening without duration. Better, we have to do with a verbal phrase, 'ceases to be *F*', which, in Ryle's later terminology, 'declares a terminus' (1954: 105). This way of speaking is to be preferred, since it is the temporal element that is to be stressed, rather than any notion relating to success, and beginnings as well as endings have the same relevant character. Compare the beginning of movement. The train is at rest, and then it moves. We cannot say: at one moment the train is at rest, the next moment it is moving. There is no next moment. But we do have a moment which defines the end of the period of rest and the beginning of the period of motion. Such end points show that there are episodes which do not take time, but, of course, they logically demand an extended state, event, or whatever, of which they are an end point—points in terms of which we earlier explained the notion of an instant. Clearly, 'exists' does not signify an instantaneous happening in this sense, does not signify something which compares with beginning to move.

To suppose that a physical object exists is to suppose that it exists for some time. That is plausible, yet it does not appear that change need enter in any way into this imaginative exercise. What is envisaged as existing could be thought of as completely static. If, moreover, there happens to be something which may function as a clock in our otherwise dormant universe, we may consider that this merely gives concrete proof of what would have remained an actuality—the passage of time—in its absence. It does not

create the presupposed persistence or continuing to be. After all, imagine there to be just one continuously changing thing—which might as well be a clock—everything else being unchanging. In this universe we can define periods during which some unchanging object has existed, but if we now suppose that clock, and only that clock, not to have existed, we surely still retain the enduring states which it was earlier thought of as measuring.

Or is that really so? If an object continues in existence, there will be moments, if not hours or years, which a given phase of its existence will span, but how can these moments be given except by changes? There could be time without change only if there could be *a* time—that is, a period of time—without change, and even if the period is not envisaged as having a beginning, it has to be thought of as continuing up to, if not also beyond, some point or other. We think we can imagine an object just persisting indefinitely in a totally inert setting, but if the object itself is not thought of as varying in any way, our imaginings none the less have to include markers which allow us to say that what we have imagined is something continuing in existence up to a certain point, if not for a determinate period. Even to say that an object *still* exists does not get us away from the need to speak of a suitable marker, some happening, if only a thought on our part, being required to furnish the point up to which things have endured. Events, not objects, have first claim to be what we time, what our clocks measure, persistence of an object being parasitic on a background of change: *x* is there when a change gets under way, it is still there when the change ceases—a 'Cambridge' change which exploits a relation to a real change, rather than being something which the object 'does' in any substantive sense—as if each thing, however unchanging to observation, had its own internal rhythm, a rhythm which marked off successive moments of which a clock might give a measure.

However, returning to our universe containing only a clock as a subject of change, it may still be insisted that such a device is not to be assigned a creative role; its function is simply to record what is there independently of it. Compare the following from Gassendi:

> Supposing now that the heaven stood still (doubtless it can be stopped by God), do you not see that time would flow in the same way as when the heaven was in motion? You might ask: how could there be the hours if the motion of the sun would not mark them off? They would exist, not because they were marked off by the motion of the sun, but because they *could be marked off* by this motion which then could exist.
>
> (Gassendi 1658: 201)

Even if all change comes to an end, time will still, surely, be passing subsequent to the cessation of change, the moment of cessation receding ever further into the past. But again we may ask: *when* will time be passing? Between *what points* will time have elapsed? We are supposing a *now* somehow given, a perspective from which the earlier cessation of motion is being imaginatively contemplated, which takes us back to our supposition of an event of some kind or another furnishing a point of reference. A specification of such a point makes sense only in relation to something in time, an event with which it is synchronous, or which precedes or follows it, just as a specification of a position in space requires reference to something in space, space itself being bereft of any such markers. There are no instants of time waiting to be matched to the divisions which a suitable periodic succession will afford, but it is only once we have a succession that instants will be definable. Yet the former, absolutist conception is seemingly inescapable if we are to make sense of time in the absence of change. The situation would appear to be as with motion. Just as we cannot admit motion of x without there being a body relative to which x is moving, so there can be temporal 'movement'—a lapse of time—only if there are points relative to which we have earlier and later, points which it takes changes to provide. If, in addition, there is no such thing as a change from one state to another, there is nothing on which a temporal ordering could be grounded.

As intimated, the elucidation of temporal persistence as no more than a Cambridge change might be invoked in support of the claim that there is no time in the absence of change. A Cambridge change is a relational change, and without one of its terms the relation itself lapses. However, without denying that time requires change, can we not conceive of an eventless period *between* changes? If we have time we have *a* time, and if we have a time we have a period with limits, limits which it requires events or changes to determine. But, granted that change is in this respect inescapable, we can surely suppose that there are no *further* changes between the end points defining the period. We have an initial change introducing an enduring state, however short-lived, a state which eventually terminates with the second change. And if this genuinely is no more than the second change, there is at least continuing to be without *accompanying* change. Compare our treatment of space. We argued that space without any occupants could not exist, but *a* space without occupants, as with an empty space between two bodies, is not to be ruled out *a priori*.

11.2 TEMPORAL VACUA

We can follow up this line of thought by considering a certain style of attempt to show the possibility of time without change in this more circumscribed sense, namely, that proposed by Sidney Shoemaker. Shoemaker imagines the world to be divided up into regions, each of which is observed by the inhabitants of other regions to 'freeze' at certain points of time, all change in the region ceasing for a period. Suppose that there is a pattern to these freezes, a pattern which, so long as it is maintained, would result in there being a time when all events come to a standstill in every region. If there were such a pattern, Shoemaker suggests, 'the inhabitants of this world would have grounds for believing that there are intervals during which no changes occur anywhere' (1969: 371; see also Newton-Smith 1980: ch. 2).

It is natural to suppose that, given what is observed, the hypothesis of a period of time in which nothing changes recommends itself as being simpler than its alternative. After all, it enables us to preserve a uniform pattern, rather than introduce discontinuities. Shoemaker remarks that the most common basis for the belief that changeless intervals are impossible is the conviction that their existence is unverifiable, to which he replies that the existence of total freezes is verifiable by standard inductive procedures (1969: 373). That is, we have this well-attested pattern of changes, and we reach the conclusion that there will be an interval of no change by projecting the pattern to future dates. However, this presumes that we have to do with an intelligible hypothesis. The basic question is not: what would count as evidence for a period of time devoid of change? Rather, how can we make sense of the passage of time in the absence of change? If we cannot give satisfaction on this score, then it can rightly be said that whatever the putative evidence is evidence for, it is not time without change. It is possible to devise a formula specifying how the freezes run in the different regions but which does not leave room for a total freeze, a formula which, however, while it fits the data, is less simple than the formula which implies a recurrent total freeze. None the less, if someone protests that, on his understanding, time and change are so bound up he cannot make sense of the one without the other, then there can for him be no question of accepting the formula implying a total freeze on the grounds that it constitutes a simpler hypothesis.

Consider further the analogy with motion. Suppose we have a universe of just two objects, so enough to enable us to make sense of motion,

and imagine that, at a particular point, continuation of the pattern so far instanced would have us say that, for a time, both objects, having been moving apart, were now moving uniformly in the same direction and at the same speed. However, while it would appear implausible to insist that the objects had both suddenly come to rest, in violation of the pattern so rigorously instanced hitherto, motion is simply not defined in such a circumstance. Each body is at rest relative to the other, and since there is by hypothesis no other body, there is no body relative to which either is in motion; and, since there is motion only if there is something relative to which a body is in motion, there is here no motion whatsoever. The definitional gap is in no sense plugged by the suggestion that it makes for a smoother theory to suppose that the earlier pattern involving continued motion on the part of both bodies is maintained. We of course prefer the simpler theory, but Nature is under no obligation to conform to our preferences.

This is not the end of the appeal to considerations of theoretical simplicity in dealing with time without change, but to the extent that the analogy with motion holds, it would appear that we have good reason to query the possibility, supposing that the coincidence of the frozen periods is thought of as a global phenomenon. We can hypothesize all change suspended in a number of regions, if these can be compared with a further region in which the duration of the freeze can be measured. However, if the freeze is held to be universe-wide, we shall, it would seem, have denied ourselves any basis for drawing a distinction between the supposed temporal lacuna and a period of unceasing change. Not only may we balk at the suggestion that our present activities, which have seemingly proceeded in an unbroken fashion for the past hour, might conceivably have been interrupted by an unnoticed six months of total inactivity; we shall also have difficulty in understanding just what could conceivably have caused everything everywhere to freeze; even worse, how might the earlier processes of change have been restarted? Coming after a period of total inactivity, any resumption of change would have to be uncaused, purely spontaneous.

It is worth noting that these latter observations apply whether or not the freeze is world wide. So, if a local freeze begins when it is raining, those outside the area will see raindrops halted in their fall; balls thrown in the air will stay there, motionless, and the flames of a fire will be 'frozen'. Clearly, we have abundant reasons for believing that such behaviour could never take place. On the other hand, while, if it were actually witnessed, we should have

to give up many of our ideas about what is physically possible, we should still not have what is needed to make sense of a global freeze.

None the less, while we may have reservations about this imagined development, it is not clear that the general hypothesis which Shoemaker takes it to support is incorrect. After all, on the face of it, the supposition that we could not have two temporally separated events but no changes over the intervening interval suggests that the thesis, time always and only with change, makes excessive demands, given the unremitting change, the perpetual flux, which it appears to entail. True, our experience of causal processes is one of processes changing continuously over time: the ticks of the clock are discrete, discontinuous, but the unwinding of the spring and other underlying movements of the clock mechanism go along smoothly without interruption. However, there is no necessity that there should be this continuity, the world of the quantum allowing for discontinuity along with changes which are not the outcome of any preceding process.

If we have two successive changes separated by an unchanging state, what is to distinguish a state which lasts ten seconds from one which lasts ten years? Thus Leibniz: 'if there were a vacuum in time, i.e. a duration without changes, it would be impossible to determine its length' (1896: Bk II, Ch. xv, §11). It might well appear that a distinction in these terms—as with ten seconds or ten years—does not make sense, that if we have *only* the changes which come with the beginning and end of the period, then we cannot ask how long the time was between them. We shall take up this question shortly, but here let us note that in a universe with just two bodies separated by empty space it would not be possible to determine the distance between them. That would require at least one further body—some form of measure, as a ruler or tape—to be set against the intervening space, or at least some form of radiation passing between the bodies. However, we should not on that account reject the possibility of an empty space; it is only its measure that has been put in doubt, only its measure that makes the extra demands.

We postulate two events, e_1 and e_2, separated by empty time, a period during which nothing happens. But nothing happening surely means nothing which might, as it were, keep the two apart. 'Time', according to Woody Allen, 'is nature's way of keeping everything from happening at once'. But there is never *just* time; it has to be something *in* time, and what could that be if not some event or series of events? How, in the absence of suitable events, could bare time bridge the gap between them unless we thought of it along the lines of some sort of stuff, or indeed some species of process—one that

mimicked an event or process in 'flowing' between the two limits? But we are quite happy to have bodies separated by a region of empty space, so why not the time between two events? Spatial separation can involve forcing bodies apart, but the locations, the points in space, at which they end up were not themselves brought there by force, and indeed to ask what *holds* apart points of space themselves is to introduce an inappropriate model of physical action.

We may be uneasy about underlying matters of causation, but we can make sense of the possibility that, outside a limited area in which we find ourselves, all change should cease, only to resume once more after a time. It would appear to be only a contingent matter that we and our surroundings were spared this fate, a fate which, had it been ours, would have gone unnoticed by us. But while our escape from a local freeze will have been contingent only, if it does extend to us it will also have been no more than a contingent matter that we should have been unable to establish directly what took place between e_1 and e_2. One individual might have retained a continuing awareness which spanned the period and which enabled him so say that changes in his mental life were the only changes that came about, from which he might conclude that, had he not been there, there would have been no changes whatsoever intermediate between e_1 and e_2. Can we now extend this observation to cover the case of a cosmic freeze?

A natural riposte is to point out that there could be no question of an observer perceiving a frozen scene. If there is no change, there is no light reflected or emitted, so no observation of anything. More important, the counterfactual situation contemplated differs crucially from the situation envisaged as actual in that it features something—a changing being—whose presence would make all the difference: of course we can make sense of the passage of time when a conscious being is around, but the universe in question is precisely one where this is not so. Note that we are not confined to imagining a person in this role, but could pose the same question with respect to a clock, as Gassendi argued. The question becomes one as to whether importation of person or clock would alter the world so as to make something so which, without such importation, would have remained otherwise. We can readily suppose that neither person nor clock would have had any relevant *causal* influence. The occurrence of e_1 and e_2, for instance, could have been untouched by their presence or absence. It has to be, rather, that only with the presence of a changing being would a certain supposition make sense, the nature of such a being providing a foundation for a non-causal possibility.

One of the main reasons for disquiet with the supposed possibility of a universe-wide freeze relates to causation, and in particular to the question of how a state in which the universe was completely inert could give rise to one in which everything unfolded as if the usual immediate causal conditions had been fulfilled. But might it not be that a period of time could itself, with no help from other happenings, be efficacious, causing the events which had 'frozen' to resume their courses? But there has to be a difference between the mere passage of time before a change gets under way, and a period which, in addition, brings about that change, and what could the extra be other than some further happening? Is it then possible to give an alternative which is free from the difficulty posed by causation? We shall consider two possibilities.

First, imagine a universe consisting solely of pulsating objects, objects which expand and contract, but which are unchanging for a period between an expansion and the following contraction. We shall suppose that there is a regularity in the rate at which a given object expands and contracts, but that the rate differs from object to object. Suppose now that a study of the patterns of change leads to the conclusion that at a certain point of time all the objects will be in an intermediate period of motionlessness. Not necessarily the same period in every case, but for a time nothing will be contracting or expanding. If, as is being assumed, this is the only form of change which takes place in this universe, we have seemingly given substance to the notion of empty time within it without putting our concept of cause under undue strain.

But again, persuasive though it appears to be, this description will still be resisted by one who denies sense to time without change. At certain points in these patterns of change, time will, as it were, stand still. But how is that to be distinguished from no time at all? The discontinuity with the patterns evidenced when there is no convergent motionlessness strongly inclines us to accept unchanging intervals devoid of change, but, by comparison with the difficulty in dissociating the passage of time from all change, the admission of discontinuities seems of no great significance—an aesthetically displeasing departure from the patterns up to that point, but no more than that.

The persuasive, yet inconclusive character of the example of bodies expanding and contracting may be found when motion is to be denied. Imagine a universe in which we have just two bodies, one of which is moving relatively to the other and which bears a light which flashes at intervals. We have enough to speak in this way—of a lapse in time between successive flashes—the continuing movement providing a bridging change between the flashes, but suppose that the other body goes out of existence. We can now

no longer speak of movement; could we none the less continue to speak of a succession of flashes? On the one hand it seems difficult to see how the cessation of existence of this independent body could issue in the relevant change: temporally spaced flashes now succeeding one another without any intervening pause. On the other hand, it appears no more paradoxical to insist on this description than to say that the movement ceased with the reduction of the bodies to one. In each case it is not a matter of the operation of a cause, but of the loss of what gave sense to movement or a temporal gap.

Our second possibility goes as follows. The Shoemaker-style thought experiments presented us with causal anomalies—as with bodies being suspended in mid-fall—which we tried to circumvent by appeal to the example of regularly expanding and contracting bodies. We might also find a way around the difficulties by ruling out a resumption of causal activity. So, suppose that the universe gradually cools down, eventually reaching a state of absolute zero when all motion ceases. We can then contemplate the continuing to be of a completely static universe, but without having to accommodate causally inexplicable happenings, there being, by hypothesis, no resumption of changes which might generate a problem. However, natural though it may be to speak of the world as it is after that point as well as the way it was before, use of 'after' clearly stands in need of justification.

The arguments continue to pull strongly in opposing directions, with no definitive conclusion in sight: on the one hand, it appears to be essentially events that demand time, objects being said to endure only by courtesy of an association with intrinsically temporal items; it is only through their co-presence with changes that bodies can be placed in a temporal dimension. What, after all, could mere persistence be? Talk of continuing to be would appear to be empty if the objects in question are in no way different by dint of persisting, neither intrinsically, nor, in an unchanging universe, relationally. Again, relevant temporal truths demand a perspective. To suppose that the universe has existed unchanged is to suppose it to have existed up to some point, but a static universe is devoid of such points. It may be objected that, while we can entertain the possibility of an unchanging object, even to describe a physical object as unchanging is, at least implicitly, to place it in time—it is unchanging from moment to moment. However, this again supposes that we have moments, points of time. Without a perspective, a point up to which an object is supposed to have endured, or after which it will continue, there is no past, present, or future. Add to that the absence of determinate temporal periods and it is hard to see what can be left of time.

On the other hand, it is difficult to resist the claim that for a body to exist is for it to exist for a time, however brief, and however unchanging the body. Strip away that dimension and you strip away a body's reality. True, something could be unchanging in the sense that the notion of change made no sense in its regard, but it is not clear that anything could be a physical object yet not be a conceivable subject of change. Likewise, a physical universe just *is* a setting in which events may take place, a setting endowed with a temporal dimension.

Again, at the beginning of this discussion it was suggested that the unremitting change required for an invariable association of time with change makes excessive demands. This remains a powerful consideration. Suppose we have a timepiece ticking off fractions of a second in rapid succession, but with a discernible gap between each tick. We know that there will in fact be many micro-events interspersed between successive ticks, but it does appear to be conceivable that these intervals should in fact have been empty of all change. It is surely quite implausible to contend that the description, 'a tick, a pause, another tick', should remain in doubt so long as we cannot add, 'and something happened in-between'. But, as just pointed out, if this is an actual report, then something did happen in-between: the reporter's consciousness spanned the successive ticks. There is a question as to how, if at all, a state of consciousness might involve continuous change, but it does appear that it has to be established that the description could continue to hold in the absence of an observer.

It would appear from these considerations that the reasonableness of speaking of a temporal vacuum can be cogently defended, but not to the point that we can actually affirm the indispensability of change. Could it be that the apparent conflict reflects the difference in what is required for the metrical features of time, as against what is required for the less demanding non-metrical conception to have application? The case for the necessity of change is irresistible with respect to the former, where the notions of something happening at a time and something going on for a time are central, and which call for the kinds of temporal marker that only events or changes can supply. Events are also demanded when a temporal perspective is presumed, as when it is supposed that something is still, or is no longer, in some unchanging state. It will be a matter of something no longer happening now, say, with now the now of some happening, and 'still' and 'no longer' will station us at some real or imagined point. But just as the metrical notions appeared to be secondary to the non-metrical when speaking of before and

after, or as long as and longer than, so perhaps a reality conceivable in non-metrical terms may remain even in the absence of the further occurrences which the metrical demands. Certainly, the duration which is seemingly an inescapable concomitant of physical existence is not something essentially metrical, in the sense that it could be grasped only by someone in possession of metrical concepts.

Not only do we have two kinds of concept to consider, but two species of empty time. Shoemaker's fantasy is thought, if accepted, to support the possibility of time without change. Perhaps it does, but not time without all change, in the sense demanded for a totally static universe. The conception of a temporal vacuum may be defensible, but it remains difficult to see how *any* temporal concepts could have application if there were no changes whatsoever. In a universe devoid of change it is not that the application of certain such concepts is temporarily suspended. There is no before or after, no now or then, no at a time or for a time, and so forth. But then what becomes of the claim that, for material things, to exist is to exist for a time? Should we perhaps conclude that physical reality is inseparable from time, that the thought that we could have a completely static universe is simply wrong?

These temporal concepts would have application in the kind of world imagined by Shoemaker, but that is not enough to establish the possibility of temporal vacua. Let us then return to the question whether it is conceivable that at some stage in the history of our universe there should have been events e_1 and e_2 separated by an interval of time in which nothing happened. Even this little would secure something of the absolutist's position. We have the undisputed consideration that the occurrence of two non-simultaneous events obliges us to accept a lapse of time, but what obliges us to accept that two non-simultaneous events have occurred?

The question becomes one as to whether we could have good reason to distinguish the two possibilities: one episode e_2 following immediately on an episode e_1, and one episode e_2 separated from episode e_1 by an interval of time. The latter is continually met with in the world as it is at present, so the question is whether, if e_1 and e_2 are the only episodes at a certain point in the history of the universe, evidence we might now have for their occurrence could continue to maintain its usual significance. At first sight, the answer would appear to be affirmative, the effects of the two episodes conceivably varying in accordance with their temporal separation. Imagine a pulsating star from which bursts of light are received on earth. The separation

of their arrival here enables us to infer a temporal separation in their actual occurrence, and the former counts as evidence of the latter without our having first to find that other changes had been taking place concurrently. We assume, as ever, that untold changes were in fact occurring in the interval between the original bursts, but we do not need that assumption to affirm that any two of them were separated in time.

But are we not repeating the difficulty met with in Shoemaker's attempt to show the possibility of time without change? We pointed out then that it was not a question of describing evidence that such a possibility was realized, since someone who considered that there could be no such thing as a period of time devoid of change would refuse to allow that any putative evidence could have that standing. However, the present case is different, in that we are not offering possible findings as constituting inductive evidence of such a period. Rather, given that the speed of light is constant, it follows logically that the two past episodes in question were temporally separated. It does not in turn follow logically that no change took place between the times specified, but it would appear—and this is a conceptual point—that no presumption of change is called for by the supposition of their separation.

However, our description of the putative possibility is questionable. There *will* be an unbroken change dating from the first burst of light until its arrival, namely, the change given with the light's journey to us. In greater detail, suppose that two pulses of light separated by an interval of time set off on their journey to us in the present. At the times of the generation of these pulses, t_1 and t_2, no other changes were, by hypothesis, taking place; in particular, no changes were taking place between t_1 and t_2. Clearly, then, the time taken for the first signal to reach us must be shorter than the time between t_1 and t_2, since there will otherwise be a continuous change—that involved in the propagation of the light from there to here—which occurs throughout the interval between them, contrary to hypothesis. However, we are supposing that the signals arrive at us with the universe roughly as it now is—as it now is, in the sense of being in a state of continual change. Accordingly, when the second signal arrives it will have had a background of change provided by the journey of the first signal extended by the events taking place here since its arrival and up to the point of the arrival of the second signal. It is thus a mistake to claim that in this instance we are mapping a pair of earlier events occurring at different times but separated by a sub-period during which no events appear to take place onto contemporary happenings which are separated by continuous change. This example is important in showing

how, even supposing we can make sense of time without change, it would be difficult, if not impossible, to find evidence that this had occurred. To this we may add the following more general consideration: it might be that a different state of affairs resulted if e_1 was immediately followed by e_2 than if there were a time lapse between the two, but that would not show that the time lapse could be devoid of all change.

And there is a further difficulty with the general hypothesis. A universe-wide freeze requires a time when everything has come to a standstill, but if relativity theory is correct, there is no such time, no question of saying that in every region of the universe all change ceases at the same moment. It has to be supposed that we are in a universe with a single reference frame, as with a universe, familiar in thought experiments, containing just two globes. At all events, a universe very different from ours. Of course, if there is more than one reference frame, then the supposition of a cosmic freeze fails anyhow, there being change in the form of movement of one frame relative to another.

An empty time is not one in which we can introduce events—it will be too late for that—but it is one in which we could have done so. An empty time could not have been filled up with events, in the sense that we might have reached the point where there was no room for more, but it could be filled in the sense that it was completely spanned. We are not worried by the question of the size of the space between *A* and *B*; it is simply the length of anything that might span it. Nor should we be worried by the question of the length of the temporal interval between *A* and *B*; it is the duration of any event that might have had *A* and *B* as its termini. Moreover, if there genuinely is a time lapse between *A* and *B*, then determinate divisions of the interval, as 'halfway between the termini', would appear to come with that lapse.

Note that I am not trading on the general presumption, well-supported though it is, that what holds for space or time will, with appropriate translations, hold for the other. It is, rather, that in the present context it is difficult to see how what counts as a reason for accepting the possibility of empty space could fail when transposed to its temporal analogue. Note, too, that just as with spatial distance we can have a mix of bodies and empty spaces over that distance, so, too, with temporal distance we can have a mix of events and unchanging phases. A greater or lesser space is a greater or lesser capacity for bodies, and the greater time is the one in which the larger number of successive events can be fitted.

But this recourse to possibility may be considered unhelpful. If it is possible that there should have been an event in some ostensible interval, then that

interval is decidedly not of zero duration, but the possibility will not provide a premise from which the existence of the interval can realistically be derived. It is, rather, the existence of the interval that grounds the possibility. It is true that an empty space is one in which it is possible to places bodies, but to find out whether that possibility exists requires us to find out whether bodies can be introduced, whereas there is no such thing as introducing events or changes into an empty time. However, this objection can be countered. A temporal interval is empty if there could be, or could have been, events within it. That is a statement of what emptiness here *means*. It is not a recipe for finding out whether an interval was or will be empty.

But we still appear to be no nearer to finding an answer to the question of what reality persistence can have if the passage of time makes for no difference in the persisting object, whether intrinsically or relationally. We say that it is only by dint of an association with changes marking off successive temporal points that an object can be said to be in time, but *what* in the object is associated with such points, given that it is unchanging from moment to moment? The door exists at noon and still exists five minutes later, with nothing in it that correlates with the later time that was not there to correlate with the earlier; indeed nothing to correlate with either time beyond the presence of the door. The thesis that 'exists' is not a predicate sheds little light on its character, but if asked to single out what differentiates it from the general run of verbs, we might say that existing is not something that anything *does*, where 'does' is associated with actions, in a very general sense, as melting, glowing, flashing, and so forth. The same goes for 'persists' and 'endures', in all three cases there being no change, action, transformation, development, or the like, nothing which could be called upon to give substance to the notion of continuing existence in an unchanging universe.

Or does this objection rest on a misconception? There may be nothing on which a difference in duration could be grounded, but then, as with space, it is a matter of the *extent* of the interval rather than of anything that takes place within it. Time has passed. Nothing has been happening; just certain things have been possible which need the passage of time. There is a difficulty in that possibilities make for no discernible difference between an interval which can accommodate *n* events and one which can accommodate twice as many, but perhaps we should not think otherwise with respect to differences in *extent*. We contemplate a totally static object and reflect that there could be a universe in which it was growing progressively older without there being any discernible change in it or in anything else, but we should not *expect* there to

be anything detectable in this way. Consider again bodies separated by totally empty space. Here, too, we find homogeneity, no differences being met with as we proceed from one point of space to another. Differences in spatial separation are real enough, but emerge only once they can be measured and compared. They are differences in the *extent* of the space, not in anything else that might be detected. If, as it would seem, time is comparable, the supposition of empty time is not to be faulted on the grounds that features of a temporally extended event need not be shared by a temporally extended body. The difference between a persisting change and a persisting body is to be found in change and body, not in the persisting.

To pursue the analogy with space, suppose we are moving through empty space from body *A* to body *B*. If our motion is uniform, there will be no way of detecting that motion if we cannot tell that our distance from *A* or *B* is changing. However closely we attend to ourselves or to our vehicle, we shall find nothing that we should not find if we were at rest. Likewise with time. We have a change in a body, after which it, along with every other body, remains in a totally static state until a second change comes about. Here too there will be no way in which the temporal 'movement' from the first to the second change will be discernible in our body, but then no expectation that it should be, any more than in the case of spatial movement.

Finally, the analogy with space even suggests that 'time' applies first and foremost to empty intervals. A space may or may not be occupied. When it is occupied, we can measure the spatial extension of the occupying body or bodies, but we shall not be measuring just space; it is when it is empty that space calls for recognition. Similarly, when we have continuous change over an interval, there is the duration of the change to measure, but no pure time. Only when the interval is devoid of change does time come into its own, as it were.

11.3 TIME, CHANGE, AND EMPIRICAL EQUIVALENCE

So where do we stand? Our argument, boosted by the analogy with empty space, gives some support to those who would insist that the concept of empty time is coherent. On the other hand, the argument to this end has been essentially negative, a matter of rebutting attempts to show the impossibility of temporal vacua. We have not been able to specify circumstances which would unconditionally ensure the reality of periods devoid of all change. Attempts

at arguing inductively for time without change presuppose the intelligibility of the concept, and this would be secured if we could describe conditions in which it applied on non-inductive grounds, but any account of circumstances in which this would be a plausible description can plausibly be resisted. The conclusion to be drawn? Supposing the concept to be self-consistent, then, if there is no observational difference between the hypothesis of empty time and the hypothesis of its non-actuality, we can opt for either alternative. Speak of empty time in such-and-such circumstances if you wish, but nothing compels this way of speaking, even if nothing compels its rejection.

Recall the decision which confronted Einstein when faced with the problem of comparing the time taken for light to travel from *A* to *B* with the time it takes to travel from *B* to *A*. There being no possible empirical demonstration that we have to do with the same or a different time, it appears that the question can be settled only by fiat. We lay it down that the times are the same, and while there can be no proof that this is so, it is not a matter of an arbitrary decision, but one that, set against the alternative, is less disruptive of the general scheme in which it is lodged.

It is worth drawing attention to the consequences which decisions of this nature have for our use of terms such as 'know', 'believe', 'be sure', and so forth. It is inappropriate for one who follows Einstein to say that he *believes* that the time it takes a light signal to go from *A* to *B* is the same as the time it takes for such a signal to go from *B* to *A*. This suggests a concern with a matter of fact about which there is some uncertainty, where one lacks the assurance which would warrant 'know'. And, of course, 'know' too is out of place. If someone asks how we know that a light signal takes the same time on each leg of the journey, then we can reject the question. If it is a matter of laying down that this is so, then it is not a matter of knowledge; all we may relevantly be said to know is how the matter has been decided. But, then, if it is not a matter of knowledge, how can we justify the *assertion* of equality, given that an assertion is standardly and rightly taken to imply relevant knowledge on the part of the speaker? But, surely, the assertion *is* odd, precisely because of this implication. We can make use of 'the two times are equal' in a way that exploits its propositional status—as when we derive an inference from it—but the bare assertion misleadingly suggests knowledge when that is not to be had. By the same token, it would be inappropriate to insist that, or doubt whether, the two times are equal.

Viewed afresh, and with these considerations in mind, the Shoemaker-style thought experiments may now be seen in a different light, a difference

which may be obscured by the fact of agreement, at a verbal level, with one who claimed that we had time without change when the frozen periods were supposed to coincide. That nothing occurs between global freeze and thaw is something we may stipulate, not something we know to be so, has consequences for our use of 'evidence', as well as for the use of 'know' and 'believe'. When, in describing the relevant circumstances, we first introduce the notion of a period during which nothing happens, it is premature to speak of evidence for there being such a period. Any evidence is more by way of a ground for affirming the *reasonableness* of enlisting this notion, supposing that it is, in the way indicated, a matter of indifference whether we do or do not invoke the concept. Having assured ourselves that time without change is a consistent concept, and having decided to invoke it in certain circumstances, we are now, but only now, in a position to reckon certain findings evidence that it applies. By hypothesis, our expectations are the same whether we say that there has been an empty interval or whether we refuse to go along with this way of speaking, but if we can have a simpler description by allowing this as a possibility, if we are not obliged to reframe laws if we take this step, but have to introduce complicating amendments if we do not, then opting for empty time has a ready rationale. By the same token, it is clear that the assignment of a particular duration to a global freeze could be only on the basis of a decision. It is not the simplest *theory* that determines the duration, but the adoption of the *convention* which brings it into line with the cases where measurement is possible.

I have likened the problem of time without change to Einstein's problem of making sense of simultaneity, but there could be a significant difference between the two, given that, in the case of simultaneity, there was not the remotest suggestion that the equal time hypothesis was inconsistent. In the present case, by contrast, some may wish to hold out for the strict falsity of the claim that there can be time in the absence of change, just as we might consider that talk of rotation is unfounded in Newton's example of the globes. What would the passing of time *mean* in the context of a cosmic freeze? There is the analogy with empty space to draw upon, but while it may strike us as persuasive, it is no more than an analogy; the central question of meaning is still with us. It may be said that t_i and t_j are separated by a non-zero temporal interval in so far as what you would expect to find when there is such an interval is not contradicted, but again that does not appear to throw light on the matter of meaning.

There is no experimental disproof of time without change, but if the supposition of its reality is logically flawed, we have as much disproof as we could wish for. That is so. It is then not a matter of indifference whether we affirm or deny the possibility. None the less, all is not lost for a possible use for 'time without change', and therewith some elucidation of its meaning, so long as we are prepared to accept the equation of meaning with use or application—or the weaker thesis that these determine meaning.

Wittgenstein is constantly decrying the conception of infinity as an immeasurable extension rather than an indefinitely repeatable technique, but even when something like the former is our model, the suspect form of words may be rescued by devising a suitable application. The following passages make the point:

> 6. In certain circumstances we might speak of an endless row of marbles.—Let us imagine such an endless straight row of marbles at equal distances from one another; we calculate the force exerted by all these marbles on a certain body according to a certain law of attraction. We regard the number yielded by this calculation as the ideal of exactness for certain measurements.
>
> Or imagine that we simply say: 'This force corresponds to the attraction of an endless row of marbles which we have arranged in such-and-such a way and which attract the body according to such-and-such a law of attraction'. Or again: 'Calculate the force which an endless row of marbles of such-and-such a kind exerts on the body'.—It certainly makes sense to give such an order. It describes a particular calculation.
>
> (Wittgenstein 1978: 263)

Such an approach might be extended to the question of whether the universe could be spatially infinite. It was suggested that space is finite if the number of bodies is finite and if there is no body at more than a finite distance from every other body. This second condition appears defensible, but it has not been ruled out that there should be an infinity of bodies. Perhaps it can be ruled out, perhaps it cannot, but even if it can be dismissed as a fiction—or, at least, not demonstrable—it could be that calculations which assume an infinity can be of service for some purposes. We are inclined to say: either there are infinitely many bodies or there are not, we cannot tell which. But, if we cannot tell which, we are not dealing with an empirically decidable hypothesis, and, whichever alternative is adopted—if any—no one's expectations will be disappointed.

Just as a notion of infinity could have a role in certain calculations, so it could be that *time without change* is a concept which finds application in

laws and generalizations. Consider again Shoemaker's scenario. It is supposed that the generalization which codifies the successive freezes will have to take a different form, depending on whether or not we allow the possibility of a period during which time passes but nothing happens. My suggestion is that this is not so. We do not have to make a complicating exception for timeless periods, but the rule which does and the rule which does not take these into account will have the same consequences, but with a possible gain in simplicity for the latter. So, we may maintain that there is a pattern of one-year freezes in each of three regions such that, if that pattern continues, there will be a year when all three regions are frozen, or we may hold that the pattern obtains unless it should lead to our having to acknowledge a year in which there is no change in any region, when a different formula is appropriately enlisted. But will we not find ourselves contradicting causal laws if we allow a suspension of all change followed by an eventual resumption of the activities and processes which had halted? But again, the same question is to be raised: will our expectations as to causal matters be disappointed if we allow these gaps?

If we are right in our claim that both Euclidean and non-Euclidean geometries can be presented as systems of necessary truths, then we have a clear example of empirically equivalent theories, with a concomitant need to turn to other virtues to provide grounds for favouring one geometry over another, as when it is found that one geometry is better geared than others to a given physical interpretation of 'straight line'. This is not disconcerting, but if time without change could be contradictory, but a contradiction which did not oblige us to formulate our generalizations in such a way that we leave no room for temporal vacua, then, surely, we could extend the same tolerance to positions which are more evidently impossible, as with backwards causation. Yes. We have to be able to say that, in some important respect, it is *as if* we had causation in this direction, just as it must be *as if*, in some sense, time were passing in an unchanging period. That requirement may be unsatisfiable, but it may be that the sorts of consideration which make backwards causation a tempting hypothesis, as with puzzling aspects of quantum physics, can be enlisted to this end.

Is this an instrumentalist position, a position which would have us subordinate truth to utility or convenience? We are not advancing instrumentalism as a position which refuses truth to theoretical statements generally, but, setting aside the case of propositions which are strictly false, the problem is that in particular, perhaps special, cases, it has not been made clear what

the conditions are in which a given proposition is to be regarded as true, leaving us no alternative but to settle the issue by taking a decision. In this respect, 'There can be time without change' is like 'Fish can feel pain'. This is the basic consideration, with so far no commitment to instrumentalism, but such a commitment may arise once we start speaking of laws. Even then, 'instrumentalism' may not give the most appropriate categorization, since we will be treating the proposition as true, but whether or not it is in place, we shall have met two desirable conditions: we shall have preserved generalizations or laws without appealing to metaphysical hypotheses to fill gaps which open up when verifiability is lacking—a common threat if an uncompromising realism is insisted upon—and we shall have done so without having to retract well-argued claims that certain suppositions are simply false. This is in opposition to a view which would seek to rehabilitate some impossible thesis by invoking its scientific utility. It may be useful or convenient to speak of electrons as if they went back into time, but it remains nonsensical to claim that this is what in fact happens, and that remains so even if it should somehow prove useful to proceed as if we had to do with a genuine possibility. Some such instrumentalist view is perhaps what those who have subscribed to the possibility of time travel have had in mind, or at least would be content with. Certainly, it is the supposed *utility* of the conception, both here and with respect to backwards causation, that appears to drive the motivation of some scientists.

What is important is that, while we may, on pragmatic grounds, justify appeal to principles that are strictly false, this virtue should not blind us to their falsity. Here modal realism comes to mind, its utility in formulating a workable system of modal logic seemingly being considered as a reason for thinking it true (Lewis 1986: vii). It is not, but it could be that, with some purposes in mind, we may rationally claim that utility wins out over truth. Thus, Nancy Cartwright argues that the fundamental laws of physics are false; they 'do not govern objects in reality; they govern only objects in models'; indeed, that they have to be false in reality to be true to the models in which explanatory power is to be found: 'There is . . . a trade-off between factual content and explanatory power' (Cartwright 1983: 4, 18, 72). Instrumentalism and realism are not necessarily in competition, but, when they are, instrumentalism does not invariably come off second best.

Perhaps the best hope for absolutism is that it should inform an instrumentalist approach, but it is difficult to see how it can achieve this without help from relationism. That is, if we should extend talk of instants or intervals

to contexts in which they are not strictly to be had, we must surely ground that talk on cases where the concepts can be explained, and this we have succeeded in doing only in relationist terms. As remarked, it is often thought that general relativity legitimizes the absolutist's points, or something like them, but the gap in our understanding is not plugged by maintaining that such points are required for certain physical theories. There is a strong presumption that terms given an instrumentalist reading should enjoy a realist role elsewhere. The Bohr model of the atom appeals to the configuration of bodies in the solar system; whether the model is satisfactory or not, it relies on at least a sketchy knowledge of that system.

To conclude, the question of the possibility of empty time is thought to be important when we seek to adjudicate between absolute and relational views. If time can elapse without any changes taking place, then it seemingly enjoys the kind of independence required by absolutism. However, if the present analysis is accepted, it is doubtful whether the absolutist can regard his position as vindicated, and that for at least three reasons. First, if the possibility of empty time is secured by fiat, it will, unlike empty space, not be a possibility we are obliged to acknowledge. Second, any benefits which admitting the description 'time without change' might have are, on the present approach, consistent with the impossibility of temporal vacua. Third, the independence which may be granted to time is severely limited. Compare space. The relationist can tolerate the possibility of empty space so long as there are bodies to invoke in defining points and distances. A matter, not of the void, but of empty spaces between bodies. Likewise with empty time. No need, perhaps, of continuous change bridging any two events, but not a matter of an unchanging sempiternal universe. In discussing Waismann's observations on the variety of idioms into which 'time' enters, we remarked that, without questioning their number or diversity, we might still reasonably set aside many of these idioms and single out a small number of uses as central. Foremost among these are uses relating to points and intervals of time, to their ordering and their measurement. For these change is indispensable, just as it is the dependence of space on bodies that is crucial for spatial concepts. Relationism, it would seem, has the last word.

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