

Time – Lecture 2

1 Two views of time: ‘dynamic’ v ‘static’ conceptions

THREE INGREDIENTS IN THE DYNAMIC VIEW: (i) A distinguished ‘now’; (ii) ‘Flow’ – the view that unlike space, time is characterised by ‘flux’, or ‘change’; (iii) Direction.

2 D. C. Williams on ‘The Myth of Passage’

- The ‘manifold’ – a 4D picture of reality. (457–458)
- The “time snobs”: “They plume themselves that by refusing to time the dimensional status they alone are ‘taking time seriously.’ ... The partisans of time often take it with such Spartan seriousness that they deny existence to virtually all of it—to all of it, in short, but the infinitesimal pulse of the present.” (458)
- “[It is claimed that]] over and above the sheer spread of events, with their several qualities, along the time axis, which is analogous enough to the spread of space, there is something extra, something active and dynamic, which is often and perhaps best described as ‘passage.’ This something extra I think is a myth: not one of those myths which foreshadow a difficult truth in a metaphorical way, but one which is fundamentally false, deceiving us about the facts, and blocking our understanding of them.” (460)
- Metaphors of “flow”: “So far as one can interpret these expressions into a theory, they have the same purport as all the immemorial turns of speech by which we describe time as *moving*, with respect to the present or with respect to our minds. Time flows or flies or marches, years roll, hours pass.” (461)
- “The obvious and notorious fault of the idea, as we have now localized it, is this. Motion is already defined and explained in the dimensional manifold as consisting of the presence of the same individual in different places at different times. It consists of bends or quirks in the world lines, or the space-time worm, which is the four-dimensioned totality of the individual’s existence. ... Time ‘flows’ only in the sense in which a line flows or a landscape ‘recedes into the west.’ That is, it is an ordered extension. And each of us proceeds through time only as a fence proceeds across a farm: that is, parts of our being, and the fence’s, occupy successive instants and points, respectively. There is passage, but it is nothing extra. It is the mere happening of things, their strung-along-ness in the manifold.” (462–463)
- The way this leads to the idea of a second temporal dimension, with respect to which something in the manifold can move – an “unhappy regress.” (463–464)
- “What, then, ... were the motives which drove men to the staggering philosophy of passage?” (464)
- Two suggestions: (i) “One of them, I believe, we can dispose of at once. It is the innocent vertigo which inevitably besets a creature whose thinking is strung out in time, as soon as he tries to think of the time dimension itself.” (ii) The view that time, unlike space, has an objective direction (and that “passage” can provide it). Williams agrees that time has a direction (“I think it plain that time does have a sense, from early to late.” (465)), but doesn’t think we need anything more than the manifold to provide it.
- “[A] sufficient difference of sense ... would appear to be constituted ... by the inevitably asymmetrical distribution of properties along the temporal line (or any other). The time-extended organization of living and conscious beings, in particular, has a special and asymmetrical ‘run,’ fore and aft. Eddington suggested that the arrow could be provided for the cosmos by the principle of entropy. As for the irrevocability of past time, it seems to be no more than the trivial fact that the particular events of 1902, let us say, can not also be the events of 1952.” (465) *Discuss*.
- The perspectival character of experience: “[E]very occasion on which we compare the world map with experience has itself a single specific location, confronting part of the world, remote from the rest. The perspectivity of the view is exactly predictable from the map. The deception with respect to time is worse than with respect to space because our memories and desires run time-wise and not space-wise. The jerk and whoosh of this moment, which are simply the real occurrence of one particular batch of events, are no different from the whoosh and being of any other patch of events up and down the eternal time-stretch. Remembering some of the latter, however, and anticipating more, and bearing in mind that while they happen they are all called ‘the present,’ we mistakenly hypostatize *the* Present as a single surge of bigness which rolls along the time-axis. There is in fact no more a single rolling Now than there is a single rolling Here along a spatial line—a standing line of soldiers, for example, though each of them has his vivid presentment of his own Here.” (467)
- “Let us hug to us as closely as we like that there is real succession, that rivers flow and winds blow,

that things burn and burst, that men strive and guess and die. All this is the concrete stuff of the manifold, the reality of serial happening, one event after another, in exactly the time spread which we have been at pains to diagram. What does the theory allege except what we find, and what do we find that is not accepted and asserted by the theory?" (467)

- The “order of priority” issue about the special character of time. “The very concept of ‘things’ or ‘individual substances’ derives from a peculiar kind of coherence and elongation of clumps of events in the time direction. Living bodies in particular have a special organized trend timewise, ... which nothing has in spatial section. Characteristic themes of causation run in the same direction, and paralleling all these, and accounting for their importance and obviousness to us, is the pattern of mental events, the stream of consciousness, with its mnemonic cumulation and that sad anxiety to *keep going* futureward which contrasts strangely with our comparative indifference to our spatial girth. An easy interpretation would be that the world content is uniquely organized in the time direction because the time direction itself is aboriginally unique. Modern philosophical wisdom, however, consists mostly of trying the cart before the horse, and I find myself more than half convinced by the oddly repellent hypothesis that the peculiarity of the time dimension is not thus primitive but is wholly a resultant of those differences in the mere *de facto* run and order of the world’s filling.” (468) (Suggestions of creatures oriented ‘sideways’ or ‘backwards’.)

- “If there is some appearance of didactic self-righteous-ness in my effort here to save the pure theory of the manifold from being either displaced or amended by what I think is the disastrous myth of passage, this is because I believe that the theory of the manifold is the very paradigm of philosophic understanding. This is so with respect to its content, since it grasps with a strong but delicate logic the most crucial and richest facts. It is so also with respect to its method, which is that of clarifying the obscure and assimilating the apparently diverse. Most of the effect of the prophets of passage, on the other hand, is to melt back into the primitive magma of confusion and plurality the best and sharpest instruments which the mind has forged.” (471–472)

3 Maudlin on “passage” and “rate of flow”

- “My ultimate aim is to defend a simple proposition: time passes. To be more precise, I want to defend the claim that the passage of time is an intrinsic asymmetry in the structure of space-time itself, an asymmetry that has no spatial counterpart and is metaphysically independent of the material contents of space-time.” QUESTION: What does Maudlin mean by ‘passage’? Is it *just* the idea that time has an objective direction, or that it gets this direction *from* something appropriately called ‘passage’?

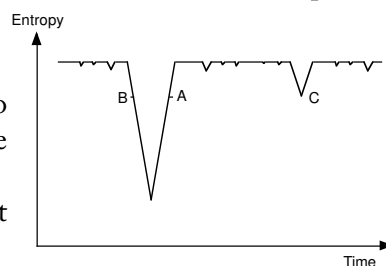
- “Except in a metaphorical sense, time does not move or flow.” (260) Nevertheless, Maudlin does think that it makes sense to say that the passage of time has a *rate* – one second per second! Other people (including me!) have thought that this idea is empty, unless it involves the disastrous appeal to an extra temporal dimension. Maudlin defends it, but seems to agree that it is trivial. My objection: if time passes at one second per second only in the sense that a corridor passes at one metre per metre, then we haven’t been given anything that distinguishes time from space – no sense in which time passes but space doesn’t!

4 Boltzmann’s brilliant idea

- Most of Maudlin’s argument actually concern *direction*, not *flow*. To get the issues about direction on the table, let’s finish with a remarkable suggestion due to Ludwig Boltzmann (1844–1906).

- BOLTZMANN’S QUESTION: Why is entropy so low now, given that that’s such an unlikely way for things to be?

- “[I]n the universe, which is in thermal equilibrium throughout and therefore dead, there will occur here and there relatively small regions of the same size as our galaxy ... which ... fluctuate noticeably from thermal equilibrium, and indeed the state probability in such cases will be equally likely to increase or decrease. For the universe, the two directions of time are indistinguishable, just as in space there is no up and down. However, just as at a particular place on the earth’s surface we call ‘down’ the direction toward the center of the earth, so will a living being in a particular time interval of such a single world distinguish the direction of time toward the less probable state from the opposite direction (the former toward the past, the latter toward the future).” COROLLARY: No objective direction of time!



READING FOR LECT 3: Price 2011 §3, Earman 1974 [hard], Mellor 2009, Sklar 1981. [\[Reading list\]](#)