

Reassessing the Prospects of C. D. Broad's Growing Block Model of the Universe

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One of the perennial debates in the philosophy of time starts from a perceived defect in Newtonian, special relativistic, and general relativistic models of spacetime alike; namely, these models all (supposedly) fail to capture an important dynamical aspect of time by presenting a purely static (a.k.a. “block universe”) representation of events. The philosophical literature contains many purported remedies for this perceived defect, but the two main lines of inquiry can be briefly (if somewhat crudely) characterized as follows. The first line tries to animate the standard block models by supplementing the *B*-series—the ordering of events with respect to earlier and later—with an *A*-series—the ordering of events with respect to the intrinsic but transitory properties of being past, being present, and being future. McTaggart (1908) is (in)famous for arguing both that the *A*-series is essential to real change and also that this series is conceptually incoherent and, thus, that time and change are ideal. Later writers have taken issue with the second part of McTaggart’s argument, and some of them are hopeful that the first route to a dynamical conception of time remains open. The second route, pioneered by C. D. Broad (1923), does not seek to achieve dynamism by adding *A*-series properties or other animating properties to block models but rather by replacing the standard block models by growing block models. Broad’s approach languished for several decades in a philosophical backwater. But it was revived and vigorously defended in Michael’s Tooley’s book *Time, Tense and Causation* (1997). Such a revival is perhaps not surprising since philosophical ideas have a tendency to recycle in popularity. But it is interesting that recently some physicists have begun to espouse versions of the growing block model (see Ellis 2006).

The purpose of this paper is to assess the viability of the growing block model. Such an assessment requires a detailed specification of how the growing block model is constituted and how it functions to support the sort of semantics and metaphysics Broad thought flowed from Becoming. Typically what we get in the literature is a diagram showing a sequence of inked columns of increasing height, which is supposed to illustrate the growth of

the growing block. A picture may be worth a thousand words, but in this case those words don't speak clearly enough to provide a basis for assessment.

I show how Broad's ideas can be implemented in the Newtonian setting in such a way that the growing block model avoids some of the embarrassments that are often claimed to arise. But at the same time it is shown that the growing block model has desired features only if it is parasitic on the block model or else the features are put in by hand. I then turn to a consideration of the difficulties that arise in trying to extend Broad's model of Becoming to the relativistic setting. While the difficulties that have amassed to this juncture do not constitute a refutation of Broad's ideas about Becoming, they indicate that these ideas can be maintained only at a considerable price. However, the fortunes of Becoming have been revived by one of the current research programs aimed at producing a quantum theory of gravity—the causal sets approach of Rafael Sorkin (Rideout and Sorkin 1999, Sorkin 2007) and his collaborators which provides a stochastic mechanism for the “birthing” of events. The kind of Becoming that emerges from the causal set sequential growth models need not conform to Broad's picture of a growing block that accretes infinitely thin layers of “now,” but his key ideas about the nature of existence and the unreality of the future are preserved.

References:

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