S. J. Prokhovnik: *The Logic of Special Relativity*. (Cambridge University Press, 1967. 32s. 6d.; $5.95.) Pp. xiv+128.

This book examines the various difficulties and controversies associated with the special theory of relativity. Since it was first formulated in 1905, special relativity has given rise to heated discussions among scientists and philosophers. To some it is the perfect theory—the very last word in physics; whereas to others it is full of logical contradictions. The author adopts a middle course, and wants to show that while the theory is 'a monument to physical insight and mathematical logic . . . its interpretation is inevitably incomplete'.

The book is divided into six chapters and six appendices, one for each chapter. The appendices contain proofs, mainly mathematical, of the results used in the main chapters. This is an excellent arrangement, since one is then able to follow the main chain of arguments uninterrupted. This will also suit the less mathematically minded reader.

Chapters 1 and 2 give the general background of the special theory of relativity and the way Einstein arrived at it. The celebrated clock paradox is discussed. The author points out that although the controversy on this subject is generally described as Dingle versus 'The Rest', the latter are very much divided among themselves at to the correct interpretation of the time dilatation effect. He points out the different points of view adopted by the principal participants in the controversy. The different ways in which the paradox is 'resolved' are described in chapter 3. In chapter 4, the concept of 'kinematic symmetry' which originated with Milne, is discussed. This concept has been developed by several authors in different ways since Milne's time. The author shows how it leads to the Lorentz transformation in one space+one time dimensions in an elegant way. However, as yet its extension to three space+one time dimensions has not been possible.

In chapter 5 the author examines the case for an aether. Although aether became unfashionable since the advent of special relativity, there are some who would like to return to it in view of the existence of controversy around special relativity. The author outlines an aether type theory which starts off with a preferred inertial frame I_s, 'relative to which the propagation of energy is isotropic and for which Newton's laws of motion hold!' A body moving relative to I_s with velocity u is contracted in its length by a factor $\sqrt{(1-u^2/c^2)}$ along the direction of motion. He then describes the phenomena usually associated with special relativity in terms of these assumptions. The final chapter is devoted to cosmological considerations. The expansion of the universe does appear to single out a special local inertial frame (in which the expansion is isotropic).

The author describes a cosmological model in which special relativity—as reinterpreted in the previous Chapter—can be applied 'in the large'.

The appendices describe useful results such as the invariance of Maxwell equations, derivation of Lorentz transformations, Møller's discussion of the clock paradox, etc.

The book is well written and will be useful to the student of special relativity because it gives a concise description of the development of the subject from various angles. An extensive list of references to the works of others quoted or described in the text is given at the end of the book.

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