

learning and human development and student teaching, could possibly become the basic course for teachers.

All those interested in the modern education scene will find much pleasure in reading these excerpts and the editors' stimulating interpretations of them. As academicians become more involved in planning teacher education programs, this material can be a source of substantial information on the educational thought of all the ages.

JOHN R. MAYOR
*American Association for the
Advancement of Science*

Relativity for the Layman. James A. Coleman. Macmillan, New York, N.Y. (reissue), 1959. x + 127 pp. \$3.50

The ABC of Relativity. Bertrand Russell (revised edition, edited by Felix Pirani). Allen and Unwin, London; Essential Books, Fair Lawn, N.J., 1959. 139 pp. \$3.50.

Both these books are intended to explain relativity to the layman. Both authors are competent to do so, and both books have sufficient merit and acceptability that one represents a revised version and the other a reissue. But there the similarity ends. Whereas James Coleman is an experienced teacher of physics at a university catering principally to undergraduates, Bertrand Russell is a veteran philosopher and mathematical logician, who addresses the highly educated and sophisticated layman.

Coleman devotes about three-quarters of his book to the special theory of relativity; in the remainder he discusses the general theory of relativity, cosmological implications, and unified field theory. For a first introduction, intended for persons not specializing in physics, this appears an altogether reasonable balance. The presentation is on the whole careful, although it is remarkable that, in his discussion of Lorentz transformations, Coleman avoids completely any discussion of simultaneous events. The explanation concerning the relative character of simultaneity, which is offered later on and which is based on the time of transit of light signals, is misleading, if not downright incorrect. Likewise the explanation of the twin "paradox" leaves much to be desired.

Probably the root of the difficulty in his handling of the twin paradox is an erroneous belief, shared by Coleman with many others, that the special theory of relativity deals only with objects in uniform motion or at rest, whereas the general theory of relativity deals with accelerated objects and systems. The fact of the matter is, of course, that the special theory deals with accelerated objects and is capable of using even accelerated (coordinate) systems, but only the general theory of relativity treats successfully the gravitational field and accelerations caused by gravitational forces. Accordingly, the twin paradox was stated and explained definitively by Einstein in his first paper on the special theory, dated 1905, long before he even came to grips with the problem of gravitation.

Though these are relatively serious criticisms, the readers for whom Coleman writes—the not-too-serious, non-science majors in an undergraduate school—will probably not be led too far astray by these lapses, and they will profit from the author's style, which conveys some of the drama of scientific discovery without becoming pompous. The illustrations are whimsical, some of them instructive, and they will maintain the reader's interest in the proceedings.

Russell writes for an entirely different public. The first edition of the *ABC* appeared in 1925, when any nonscientist would read a book on relativity only because of intellectual curiosity, not because science might be good for something. Accordingly, Russell makes demands on his readers' intellectual cooperation, and he hardly bothers with "sweetening the pill." This is a serious book, which includes a discussion of the epistemological aspects of relativity, as well as of its relationship to quantum theory and to the remainder of physics and the natural sciences. Less than half of this book is devoted to the special theory, and several chapters are allotted to the philosophical and semiphilosophical issues. There is one passage of dubious validity that I noticed: It is claimed that the steady-state model is consistent with the conservation of energy, an assertion that is, at best, speculative. Otherwise the book is written elegantly, with Russell's usual felicity of formulation. For the truly intelligent layman, Russell's exposition, along with Einstein's own (*Relativity, the Special and the*

General Theory, 1917) and that by Einstein and Infeld (*The Evolution of Physics*, 1938) remain my favorites. The revisions by Pirani have brought the book up to date, without destroying the continuity of contents and style.

PETER G. BERGMANN
*Department of Physics,
Syracuse University*

Scoring Human Motives: A Manual. John Dollard and Frank Auld, Jr. Yale University Press, New Haven, Conn., 1959. 452 pp. \$9.50.

Anyone interested in the analysis of verbal productions, such as those used in psychotherapy, will find this book indispensable. Based on extensive research, it gives instructions for delimiting each unit and for ascribing conscious or unconscious motivations such as anxiety or hostility. Two chapters of evidence are presented in support of validity and reliability.

The main content of the manual comprises the coding categories, their definitions, and some extensive illustrations and practice exercises. There are 77 categories of classifications of the patient's productions; 15 of these are major categories, the others are permutations. There are only four important therapist's categories; this small number is probably the main weakness of the manual. Perhaps this may reflect restrictive aspects of the authors' therapy. However, the authors indicate, possibly as self-justification, that other investigators have devised numerous methods for analyzing the verbal activity of therapists, and that it is the client material which has not previously been well handled.

Hours of careful hypothesizing and validating are reported. Dollard and Auld have produced what is undoubtedly one of the best available classification schemes for analyzing client productions in psychotherapy. Whether the scheme can be used in nontherapeutic interviews is not easily determined, since the motives occurring in other types of interviews may constitute different patterns; it seems probable, however, that the method has fairly widespread applicability. Although the authors have reviewed the contributions of other investigators, an apparent oversight is the lack of reference to the classification scheme for motives devised by Henry