relativity primarily from the postulational standpoint. The development of special relativity is followed by the formulation of the general theory leading up to the Schwarzschild line element and the cosmological problem.

In the second edition (1945) an appendix was added which brought the general theory up to date, and with the present (fifth) edition a second appendix has been added to discuss the developments of the nonsymmetric field which has occupied so much effort in recent years. This appendix is the major reason for bringing out a new edition at this time. Shortly before his death, Einstein succeeded "in simplifying the derivations as well as the form of the field equations. The whole theory becomes thereby more transparent." The major difficulty in unified field theories becomes immediately evident—the lack of experimental evidence. We have succeeded in constructing a logical description of a universe —perhaps several universes; the question still remains which one, if any, will turn out to be an adequate description of the universe in which we live. As yet the astronomers have not found the necessary evidence to choose between them. The possibility of constructing more complex field theories is mentioned, but Einstein rejects these (for the present) on the basis that such complication should be introduced only when there exists physical-empirical reasons to do so. The nonsymmetric character of the field was introduced only because the symmetric field could not yield, in itself, an adequate physical description. To add complexity before it is needed violates the truly fundamental axiom of relativity, that of maximum simplification.

This slim book is not to be considered as a text (to be compared with Bergman's *Introduction of Relativity* for example) but rather as a condensed unified presentation intended for one who has already gone through a standard text and digested the mechanics of tensor theory and the physical basis of relativity. Einstein's little book then serves as an excellent tying-together of loose ends and as a broad survey of the subject.

Introduction to Modern Physics (5th Edition). By F. K. Richtmyer, E. H. Kennard, and T. Lauritsen. 666 pp. McGraw-Hill Book Co., Inc., New York, 1955. $8.50. *Reviewed by Malcolm L. Stitch, Hughes Aircraft Company.*

The number of pages in the present edition of this venerable war-horse has actually been decreased by 93. This has been accomplished by a general "tightening up" in the range of the subject matter while in some cases (e.g., "Wave Mechanics") increasing the depth of the discussion.

In keeping with the title there is more correlation in this edition between the space devoted to topics in a given field and the research activity in these fields. Thus "X-rays" have been abbreviated, while "The Nucleus" and "Cosmic Rays" have been slightly increased in number of pages of this smaller book. "Electromagnetic Theory" as a branch of classical physics

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now properly appears in the appendix. None the less it is not clear why the extremely active field of solid-state physics receives so little attention in this work. Only 26 pages are devoted to it, while x-rays receive 60 pages.

One may also criticize the rather long lag between techniques and work of interest and their appearance in this edition. Thus, for example, the work in nuclear induction and the use of the Stark effect in microwave spectroscopy occurring several years before 1950 were not mentioned in this work published in 1955.

The foregoing criticisms should not reflect on the general excellence, style, and treatment which remain of great pedagogical value.

Electrochemical Affinity: Studies in Electrochemical Thermodynamics and Kinetics. By Pierre van Rysselberghe. 109 pp. Hermann & Cie, Paris, France, 1955. Paperbound. *Reviewed by Norman H. Nachtrieb, Institute for the Study of Metals.*

Anyone who has ever carried out measurements involving galvanic or electrolytic cells is familiar with the fact that comparatively few operate according to the predictions of the simple equilibrium theory. Such elements of irreversibility as concentration polarization in the electrolyte, internal resistance, mixed reactions at electrodes, and gas overvoltage or other slow electrode reactions may enter and cause deviations from the Nernst Law. The irreversible performance of electrochemical cells is not always undesirable, of course; polarography owes its existence to the element of irreversibility arising from the diffusion-limited rate of electrode processes.

This little monograph attempts to develop the rational basis for electrochemical cells operating either reversibly or with certain kinds of irreversible processes from classical thermodynamics and irreversible thermodynamics. On the whole, it is remarkably successful. Topics for discussion include the Tafel equation for gas over-potential, electrode reactions in which several processes occur simultaneously, and athermal phenomena in electrochemical cells (Peltier Heat, Thomson Heat).

A prior knowledge of both equilibrium and irreversible thermodynamics is assumed, although the entire development is logical and progressive, beginning with the 1st and 2nd Laws. The authors' objection to the designation of half-cell "standard electrode potentials" is probably quite valid, but this usage is so widespread as to be difficult to alter. Certainly, the unwieldy "standard relative electrode solution electric tension" is not a happy way to correct an unfortunate but long established use of the term "potential". In general, the thermodynamic symbols and terminology used are readily understood, although they differ in a few instances from those prevalent in the United States. The use of the term "free enthalpy", G, in place of the more familiar "Gibbs free energy" is an example. A