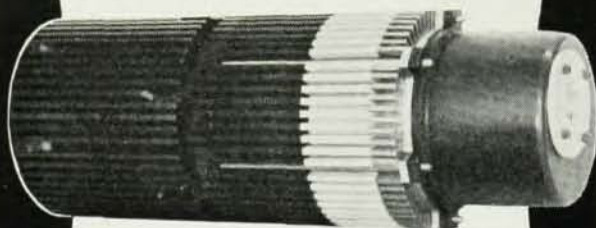


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covery and understanding of such difficulties than to their solution. The vastness of the problem is apparent in the wide choice of approaches currently considered by various investigators. This state of affairs makes review volumes on the subject most useful, even if two such books are separated by a comparatively short interval of time. Indeed, no single volume can deal extensively with all the aspects of current gravitational research.

The book under review meets the high standards to which readers in the field have been accustomed for the last few years, with respect to both competence of the contributors and careful presentation. The larger part of the book is made up of review papers on the following topics: the experimental situation of the theory of gravitation, solutions of the field equations of general relativity (exact solutions, equations of motion, the Cauchy problem), conservation laws in general relativity, gravitational radiation, and relativistic cosmology. In addition, four papers are devoted to analyses of particular theories: an interesting confrontation is offered of two rival approaches to the quantization of the gravitational field (the canonical approach and the "geometrical approach", in which the stress is on general covariance), and two expositions are presented on attempts at a unified geometrical theory of the gravitational and the electromagnetic fields (a detailed presentation of the Einstein-Maxwell-Rainich system of field equations, and a qualitative sketch of "geometro-dynamics"). Useful mathematical summaries of the geometrical background of general relativity are found in the chapter on exact solutions and as appendices to the chapter on cosmology.

In view of the purpose of the book, one may regret that it is practically two years old at the time of its release, and that several authors have been obliged to update their papers with "notes added in proof".

Instead of the usual subject index, the book is provided with a very detailed table of contents. Such a table is undoubtedly useful, but it may be disputed whether it really is as handy as a conventional index.

The Classical Theory of Fields (2nd ed.). Vol. 2 in Course of Theoretical Physics. By L. D. Landau and E. M. Lifshitz. Transl. from Russian by Morton Hamermesh. 404 pp. Pergamon Press, London, 1962. Distr. in US by Addison-Wesley Publishing Co., Inc., Reading, Mass. \$12.50. Reviewed by C. H. Holbrow, Haverford College.

ASIDE from a five-dollar increase in price, the principal changes in this second edition are additions to and revisions of the interesting chapters in general relativity and gravitational field theory. The remainder of the book continues to serve as an excellent exposition of classical electromagnetic field theory and special relativity.

The authors begin by formulating the theory of relativity in terms of the principle of least action. This rather abstract approach to their subject matter is

maintained throughout the book. Traditional topics such as the behavior of charged particles in electromagnetic fields, radiation, and geometrical and physical optics are discussed. However, little feeling is conveyed for the physical significance of these phenomena. For a student to benefit from such an abstract approach as presented here, he must already be well acquainted with the material. Consequently, the book is not primarily useful as a textbook in electromagnetism although much of the book consists of applying Maxwell's equations to specific problems. Furthermore, there appears to be little attempt to exhibit explicitly the general features of a field theory or to discuss the virtues and defects of such a theory. The chief utility of this book is as a reference to convenient ways of obtaining solutions to traditional problems of classical electromagnetism.

Tensors are used freely throughout the book, and it is claimed that the necessary knowledge of tensors is adequately developed in the text itself. This claim is formally true, but little attempt is made to give the student a feeling for when and where and why tensors are used. A student with no previous acquaintance with tensors will not be satisfied with what he learns from this book.

In addition to the high price, the typography is poor. There appears to be approximately one typographical error per five pages. Both the high price and poor typography are features this reviewer has come to associate with the Pergamon Press.

Problems in Quantum Mechanics. By I. I. Gold'man, V. D. Krivchenkov, V. I. Kogan, V. M. Galitskii. Transl. from Russian and edited by D. ter Haar. 394 pp. Academic Press Inc., New York, 1961. \$12.00. Reviewed by Nandor L. Balazs, *State University of New York, Stony Brook.*

PROBLEM solving is one of the innocent pleasures of a physicist. Everything is so attractive! The problem has already been formulated and posed; one knows that a solution exists and cannot be too difficult; at the end one can bask in a self-satisfied glow of accomplishment.

If you want to indulge vicariously in this manner, read the present collection. There are 333 problems in the book. (Of these, according to my count, only 28 have already appeared in Landau and Lifshitz's *Quantum Mechanics*.) The listing of the problems takes up 49 pages, the answers 331 pages. It is quite evident that you get a lot of instruction with the solutions. The questions are grouped in nine sections: one-dimensional motion, energy spectrum and wave functions; tunnel effect; commutation relations, Heisenberg relations, spreading of wave packets, operators; angular momentum, spin; central field of force; motion of particles in a magnetic field; atoms; molecules; scattering.

The problems are of varying complexity, starting with simple ones and ending with rather more serious in-

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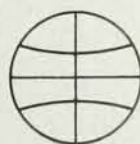
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