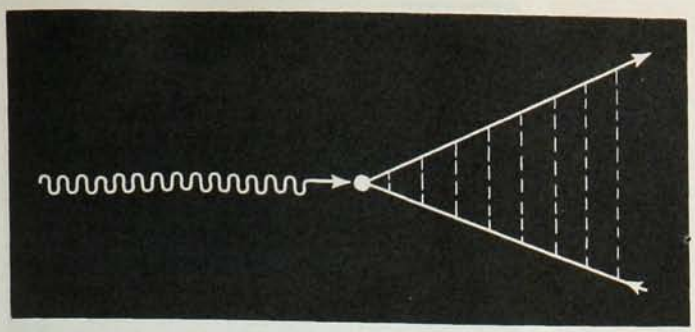

FEYNMAN DIAGRAM for creation of electron-hole pair by photon absorption.

nature, which gets dropped among the authors. Therefore a review of a field compounded of contributions from many loosely coupled authors rarely competes in overall value or quality with a review by a single expert. *The Optical Properties of Solids* suffers from this syndrome no more than the average but enough to render it unsuitable as a textbook.

For the person with a sound basic training in optical properties who wishes an up-to-date survey of many aspects of the field, this book can be enthusiastically recommended. All the lectures deal with current research and touch on unsolved problems, and each chapter contains an extensive bibliography of recent publications. Magnetoöptical effects, band structure and interband transitions, excitons, photon-photon interactions, and plasma effects are among the many topics discussed. Semiconductors and metals are the focus of interest, but some attention is given also to solid rare gases and silver halides. It was disappointing that there was not a more thorough discussion of nonlinear optical phenomena.

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Thomas A. Scott, professor of physics at the University of Florida, has built up a solid-state laboratory that specializes in magnetic resonance and low-temperature, high-pressure experiments.

Symmetries and dynamics

PARTICLE SYMMETRIES. (Vol. 2, Brandeis University Summer Institute, 1965). M. Chretien, S. Deser, eds. 691 pp. Gordon and Breach, New York, 1966. $35.00

by Don B. Lichtenberg

This book of lectures by well known research workers in elementary-particle physics is more than a book on symmetry, but includes topics in the dynamics of weak and strong interactions. As such its usefulness is considerably enhanced.

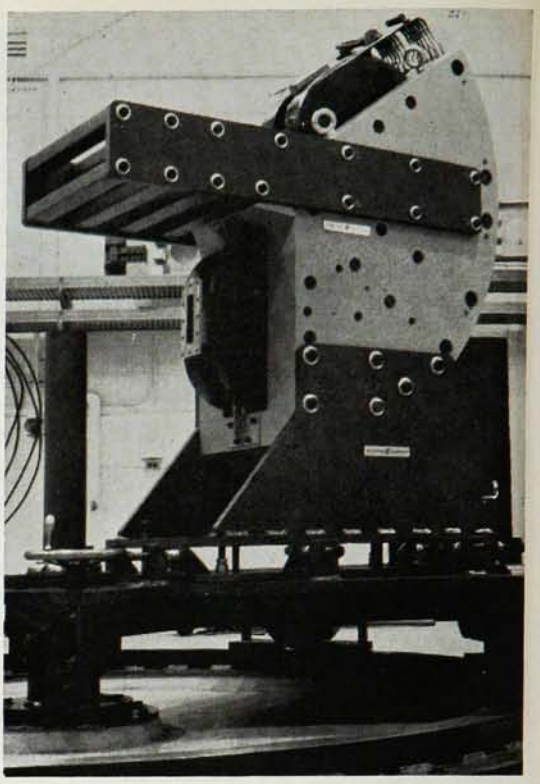
The lecture notes are arranged alphabetically by author rather than in any logical order. Thus, for example, the most elementary lectures by F. E. Low, which give a general introduction to the idea of symmetry in particle physics, should be read first. However due to the accident of Low's name, these lecture notes are presented next to last.

I particularly welcome the lectures by A. H. Rosenfeld on the phenomenology of mesons. We cannot be reminded too often that physics is an empirical science, and we cannot hope to understand symmetries and the dynamics of nature if we do not have more than just a nodding acquaintance with the facts. However the facts about baryons are just as important as those about mesons, and it is a weakness of the book that lectures were not given on the baryons as well.

The different sets of lectures vary both in level of presentation and in quality. Part of this variation can be attributed to the different notetakers, and part to the differences in the style of the lectures. However, much of the variation undoubtedly arises from the nature of the material presented.

As an example of the contrast between different sections of the book, I shall consider the lectures of N. Cabibbo on weak interactions and those of R. E. Cutkosky on bootstrap models of strong interactions. The Cabibbo

A Study of the Beam Transport and Analysis System for the New Linear Accelerator ...University of Toronto



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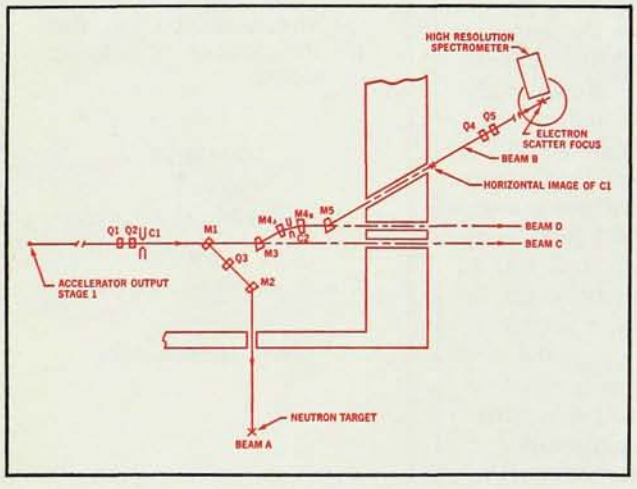
Beam Legs Four beam legs are provided. System *A* is an achromatic beam leg which transports particles through a 90° bend and focuses them on a neutron target. System *B* transports the beam achromatically through a net 30° bend and focuses it onto the target for the Spectrometer.



This system is designed for both high resolution and excellent transmission. A four magnet system is used bending the beam −30°, +15°, +15°, −30° in an array which is fully symmetrical about the momentum defining slit C2. *Beams C and D* are intended for additional experimental areas.

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Power Supplies Power Supplies for the system are also designed and built by Varian. All units are fully solid state, utilizing silicon semiconductors and precision zener references. A master reference system, which provides the basic reference voltage for all power supplies, permits accurate and easy system energy adjustment.

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lectures give an extremely useful and general description both of the symmetries and dynamics of weak interactions. This short and lucid treatment makes an excellent introduction to the subject. On the other hand from the notes of the lectures on bootstraps I have obtained the impression that trying to solve strong interaction problems by means of self-consistent methods is at present little more than a clever idea. The ultimate program is highly ambitious, but the calculations done thus far are over-simplified and are not convincing. If a solution to the problem of strong interactions is to be found along the lines outlined by Cutkosky, much ingenuity will be required and plenty of hard work.

The remaining contributions are by B. W. Lee on the group SU(6) and current algebras, and by T. D. Lee on the possible noninvariance under charge conjugation of the electromagnetic interactions of strongly interacting particles.

This book, like most volumes of lecture notes, contains some material that is unpolished and hastily considered. To compensate for these defects, the aim should be for high speed of publication and low cost. The present publisher has failed on both of these counts. However, remarkably enough, very little is obsolete, and the work promises to be useful for some time to come.

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The reviewer, a professor of physics at Indiana University, specializes in the theory of elementary particles.

Generalized functions

FOURIER TRANSFORMS AND THE THEORY OF DISTRIBUTIONS. By J. Arsac. Trans. from French by A. Nussbaum, G. C. Heim. 318 pp. Prentice-Hall, Englewood Cliffs, N. J., 1966. $14.00

by Theodor Teichmann

The theory of distributions, or of generalized functions, has provided a very effective extension of the domains of many important mathematical operations, and thus has made possible the direct application of important applied mathematical techniques without special subtle considerations or purely heuristic justification.

This book presents a development centered mainly around the Fourier transform and its application to optical and communication problems and to some extent to partial differential equations. The treatment itself is a rather peculiar mixture. There is a relatively abstract mathematical section that seems unnecessarily detailed for the applications, yet not deep or precise enough from the purely mathematical angle, with many important results being stated without proof. Many useful formulas involving distributions may be found in the book, provided one goes through it systematically. Despite the heavy mathematical introduction, the treatment of the applications is mainly formal or heuristic, thus making the mathematical introduction even more superfluous. While there is much useful and indeed interesting material in the book it is unfortunately rendered confusing by the uneven mathematical tenor. The translators have not ameliorated this situation with a rather questionable semiliteral translation in order "to preserve the spirit of the original."

* * *

The reviewer is a theoretical physicist at the General Atomic Division of General Dynamics Corp., San Diego.

NEW BOOKS

ELEMENTARY PARTICLES & FIELDS

Algebraic Theory of Particle Physics. By Yuval Ne'eman. 334 pp. W. A. Benjamin, New York, 1967. Paper $5.95

NUCLEI

Intense Neutron Sources. Conf. proc. (Santa Fe, New Mexico, Sept. 1966) US Atomic Energy Commission, Washington, D. C., 1967. Paper $3.00

ATOMS & MOLECULES

A Guide to the Laser. David Fishlock, ed. 163 pp. American Elsevier, New York, 1967. $8.50