wave functions in the atomic cores has been projected out of the model wave functions. The result is a theory which has proved to be well suited to treating, in a unified manner, the very wide range of quantum problems that arise in solids and in liquids as well.

This monograph represents a detailed account of the author's work on metals using this method during the period 1958–1965, and it contains also adequate references to the work of others using the same method. As such, it should prove quite useful to students entering the field, because the approach is straightforward. The growing accomplishments of modern physics present the beginner with a barrier of ever-increasing height as well as width. A simple, unifying language reduces the problem of digesting information on a wide scale, and a monograph such as this can contribute significantly toward overcoming the initial psychological barrier.

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Reproductive Endocrinology

Marshall's Physiology of Reproduction. Vol. 3. A. S. PARKES, Ed. Little, Brown, Boston, 3rd ed., 1966. 1184 pp., illus. $70.

Volume 3 of A. S. Parkes's revised version of F. H. A. Marshall's *Physiology of Reproduction* is devoted to endocrinology. It contains ten chapters written by the editor and seven outstanding British experts, I. W. Rowlands, M. Allanson, B. T. Donovan, G. W. Harris, J. O. R. Morris, R. Deanesly, and A. E. Kellie.

The first four chapters are concerned with the hypothalamo-pituitary-gonad axis and all of its ramifications. In addition to discussing functional relationships these chapters include careful descriptions of the anatomy of the hypothalamus and the hypophysis, an examination of comparative morphology among different species, and a careful consideration of hypothalamic and hypophyseal cytology in normal and experimental states. A much-needed discussion of antigonadotrophic activity is presented by Rowlands and Parkes. Although the relationships between the hypothalamus and the hypophysis are elucidated in detail, the possible role of other components of the central nervous system in the regulation of the axis is examined only cursorily, possibly because of the lack of any very detailed data.

Morris presents a detailed description of the chemistry of the various gonadotrophins in a careful review which describes assay methods as well as methods of purification of three trophic hormones from the pituitary, two chorionic gonadotrophins, and human menopausal gonadotrophins. Advances in the chemical identification of these compounds which have occurred in the past three years are not included.

There follow three chapters concerned with the gonadal hormones and their biochemical activities. In addition to discussions of the chemistry and physiology of androgens, progestogens, and estrogens, there is a brief discussion of nonsteroidal estrogens and a rather abbreviated account of relaxin as an ovarian hormone. Kellie's account of the biogenesis of gonadal steroids is thorough, particularly as it relates to the biosynthesis of cholesterol as the major steroid hormone precursor. Here again, some recent work on the enzymatic reactions involved is not included.

A long and thorough discussion by Deanesly on pregnancy and fetal life inquires further into the role of relaxin and includes the role of ovarian and pituitary hormones as well as placental hormones in implantation and pregnancy maintenance. She reviews admirably the problem of pregnancy termination and the mechanism of parturition. A rather brief discussion of mammary gland function in pregnancy precedes an even briefer one concerned with adrenocortical, thyroid, and liver function. An excellent review of fetal endocrinology is contained in this chapter. The chronology of the development of endocrine dependence is clearly set forth, and interactions between the fetus and the maternal organism are described.

In the final chapter, on relationships between gonads and adrenal glands, Parkes and Deanesly present in good detail the evidence for adrenal participation in various reproductive phenomena and discuss the effects of gonadal steroids upon adrenocortical activity. The fact that steroids having sexual effects are produced both by gonads and the adrenal cortex is well documented, and the possibility of gonadal function as an adrenal cortical substitute is also indicated. It is clear from this chapter that our knowledge of the nature of the control of sex hormone production by the adrenals and perhaps of adrenocortical hormone production by the gonads is still quite rudimentary.

This volume brings to a conclusion the opus begun many years ago and subject to a number of delays. With the ever-increasing production of experimental and clinical data relating to reproductive physiology, it is unfair to expect a book like this to be up to date. The editor's hope that "it will not get out of date" is, I believe, well justified by the superior quality of the presentations, the excellent illustrations, and the citation of outstanding and relevant publications. It is clear that the authors have not attempted an exhaustive bibliography of reproductive physiology, but they certainly have attained a fairly representative one. In a volume containing contributions from an assemblage of authors there often occurs quite diverse performance. Here Parkes has succeeded in maintaining a remarkably uniform standard of excellence. This volume alone should be invaluable to students of reproductive physiology, of special interest to the experimentalist, and informative of basic concepts and processes to clinical and public health workers. Although its prediction of truly exciting developments in the field of reproduction is rather limited and conservative, the discerning mind may easily construe from the data presented what should be, and in fact have often become, new directions for research. With the publication of this final volume of the work a most substantial treatise on the whole field is now available. In undertaking this revision and limiting the revisers to experts from Marshall's beloved England, the editor assumed a monumental task. It is most laudably fulfilled, and the world biomedical community is indeed in his debt.

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For Physics Students

Mathematical Methods in the Physical Sciences. MARY L. BOAS. Wiley, New York, 1966. 790 pp., illus. $11.95.

Boas has adopted one of a number of possible views as to how undergraduates majoring in the physical sciences should learn mathematics. This viewpoint is that such students need a utilitarian knowledge of a va-

riety of material concerning analysis, special functions, vector analysis, and so on in order to pursue their studies of the physical sciences and that furthermore, this material should be presented in a single course. There is, of course, substantial room for controversy with respect to this position; however, having adopted it Boas proceeds to develop the material she considers essential lucidly and with a variety of examples. The material she covers encompasses rudimentary real and complex analysis; ordinary and partial differential equations, including Fourier series, special functions, and integral transforms; vector and tensor analysis; determinants and matrices; the calculus of variations; and probability. None of these receives a very modern or sophisticated treatment but each is treated adequately for the purposes of solving the kinds of problems that characterize advanced undergraduate courses in the physical sciences. One of the strong points of the presentation is the inclusion of a number of worked problems in the text. These examples might, however, have been distinguished a little more definitely from the actual expository material in order to accommodate those students (and faculty) who can master the material more quickly. A large selection of exercises is included with each chapter, enough so that the problem of complete overlap of homework assignments in successive years should not be troublesome. The book is well produced with pleasant typography and clear illustrations. In general I would recommend its consideration for use in a junior-level course.

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Religion in Indian Life

The Peyote Religion among the Navaho. DAVID F. ABERLE. Aldine, Chicago, 1966. 480 pp., illus. $10.

Probably no phenomenon of American Indian life, and certainly no nativistic religious movement, has been as thoroughly documented as the Peyote religion. Peyotism as a cult of Christianity came into being in the latter half of the 19th century, and both its spread and its study were vastly facilitated by the speeding up of communications and transportation which had occurred by that time.

Today peyotism is a political as well as a religious issue to the Navaho people. "Progressives," who have had more frequent contacts with other tribes and are aware of the need for unified Indian thought and action, are more likely to support—or at least not oppose—peyotism as a way of life than are the "long hairs" or old-timers. A large part of David F. Aberle's scholarly and impressive contribution is devoted to this aspect of peyotism. Aberle has attended meetings among the Navaho in several parts of the reservation and has interviewed both Navahos who support and Navahos who attack the cult.

To one who has been attending peyote ceremonies in Oklahoma since the mid-1930's, the Navaho peyote ceremonialism appears to be a curious mixture of rites from various tribes. The ceremonies are held inside permanent buildings set aside specifically for that purpose, as is the case with the "East Moon" rite of the Osages, Poncas, and their southern Siouan relatives. However, Navaho peyote rites lack some of the Roman Catholic elements present in "East Moon" rites, and the dominant tone seems to be akin to that of the Protestant-based "West Moon" ceremonies of the Kiowa, Comanche, Sac, and other western Oklahoma tribes. Kiowas and Comanches together furnish most of the ritualistic paraphernalia in use in Oklahoma, and certainly the fans shown in one of Aberle's plates are of Kiowa manufacture, probably a gift from a peyote "brother."

Aberle has not been content to present ritual divorced from philosophy, and his discussion of the underlying thought of peyotists is valuable to the student of religions in general. Among the Navaho, as elsewhere, peyote is basically a religion of healing. In this it is closely related to the old Navaho religion, with its chants and rituals intended to bring and maintain health.

Aberle's study of the economic aspects of peyotism is closely detailed, and, indeed, this book is one of the few publications which present such material in compact form for any North American Indian group. The information is at best hard to come by, and too few writers have had the ability and the patience to correlate economic factors with the religious beliefs and practices of the Indians.

Recently I attended a peyote ceremony in Oklahoma at which two Navaho boys were present. They had attended a government boarding school in Anadarko, Oklahoma, and had "joined peyote" there. They arrived at the meeting in question simply by walking onto a powwow ground and asking where the meeting would be held that Saturday night. After the ceremony the entire group sat listening to tape-recorded peyote songs. The tapes had been brought to this meeting, which was sponsored jointly by Sac-Fox and Kickapoo roadmen, by a Pottawatomi from Kansas who had recorded the songs at a Ute meeting in Utah. Originally the songs had been Kiowa, and I, a non-Indian who had done research among the Kiowa, could understand some words. However, all the other listeners agreed that the words were nonsense syllables to them.

In view of the concrete evidence of the processes of diffusion which incidents such as this one provide, one must agree with Aberle's conclusion that peyotism is an increasing force in American Indian life. As he points out, it can be the most potent form of Pan-Indianism.

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New Books

Advances in Automobile Engineering. vol. 4, *Combustion Processes in the Spark Ignition Engine.* Proceedings of a symposium (Cranfield), July 1965. D. Hodgetts, Ed. Pergamon, New York, 1966. 208 pp. Illus. $9.50. Six papers.

Advances in Biology of Skin. vol. 7, *Carcinogenesis.* Proceedings of a symposium (Portland, Ore.), April 1965. William Montagna and Richard L. Dobson, Eds. Pergamon, New York, 1966. 372 pp. Illus. $16.50. Nineteen papers.

Ages of Rocks, Planets, and Stars. Henry Faul. McGraw-Hill, New York, 1966. 119 pp. Illus. Paper, $2.45. Earth and Planetary Science Series.

Annual Review of Entomology. vol 12. Ray F. Smith and Thomas E. Mittler, Eds. Annual Reviews, Palo Alto, Calif., 1967. 573 pp. Illus. $8.50. Twenty papers.

An Anthology of Philips Research. H. B. G. Casimir and S. Gradstein, Eds. Published for N. V. Philips' Gloeilampenfabrieken, Eindhoven, The Netherlands. Centrex Publishing Company, Eindhoven, 1966. 469 pp. Illus. $5.

Anticancer Agents. Frances E. Knock. Thomas, Springfield, Ill., 1966. 292 pp. Illus. $15.50.

Aspects of Medical Physics. Review papers presented at the First International Conference on Medical Physics (Harrogate, England), September 1965. J. Rotblat, Ed. Taylor and Francis, London, 1966. 196 pp. Illus. $6.50. Nine papers.

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