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-