extensive and includes numerical investigations of the basic properties of the reformulated equations as well as an analysis of noncylindrical axons and of synapse thresholds.

Despite its sometimes erroneous presentations of physiological background material the book provides stimulating reading. Since it offers a number of increasingly difficult approaches to essentially only two, albeit large and complicated, problems, it can be recommended as supplementary reading for students in biomathematics.

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Comparative Endocrinology

Steroids in Nonmammalian Vertebrates. DAVID R. IDLER, Ed. Academic Press, New York, 1972. xii, 504 pp., illus. $28.50.

While nonmammalian endocrinology has been used in a practical way for a long time—witness the use of the capon comb for the assay of androgens, the pigeon crop sac for the assay of prolactin, and both the male and female frog for the identification of human chorionic gonadotropin in urine—the development of comparative endocrinology as a discipline has occurred largely during the last decade. In recent years introductory textbooks and review articles have appeared and symposia have been held, but this is one of the first scholarly treatises on a broad segment of the subject. The book suffers from the common afflictions of treatises written by many authors, but it is a valuable addition to the literature.

One of the primary aims of the book as set forth in the preface is to evaluate the identification and quantitation of the steroids that various authors have claimed to be present in the various nonmammalian vertebrates. After an introductory chapter in which the significance of steroid studies in nonmammalian vertebrates is discussed, a chapter is devoted to the values and the limitations of the different techniques that have been used in steroid studies. The authors attempt to weigh these in terms of their significance in identifying and measuring steroids. This necessarily involves subjective decisions, but the long experience of the authors, and particularly the editor, makes the evaluation a valuable guide to the significance of published work.

A chapter by Lofts and Bern is an excellent discussion of the evolution and functional morphology of the steroid-forming tissues. This is followed by an extensive critical consideration of the chemical structures, biosynthesis, and metabolism of cortical steroids in fish. The nature and biosynthesis of cortical steroids in amphibians, reptiles, and birds are well dealt with in the next chapter, but there is no discussion of their catabolism. The chapters by Ozon on the androgens and estrogens of the lower vertebrates are excellently organized but are summaries rather than exhaustive critiques. The final chapter by Chester Jones and co-workers on the biological actions of the steroid hormones gives a good general review, but its value is somewhat impaired because the literature is reviewed only through 1969 and much of the work on mechanisms of steroid action on nonmammalian target tissues which has been so enlightening is omitted.

Tables have been used effectively throughout the book and will serve as excellent sources for checking data on identification, biosynthesis, metabolism, and physiological action of steroids in the nonmammalian vertebrates. Although coverage is somewhat uneven, the book is a valuable reference work.

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NMR and Magnetism

Nuclear Magnetic Resonance in Ferro- and Antiferromagnets. E. A. TUROV and M. P. PETROV. Translated from the Russian edition (Moscow, 1969) by E. Harnik. Israel Program for Scientific Translations, Jerusalem, and Halsted (Wiley), New York, 1972. viii, 206 pp., illus. $24.

This work is the first text to deal with the subject of nuclear magnetic resonance in magnetically ordered materials, one which has developed rapidly since the late 1950's. The English text is a fine translation.

The contributions to the book are divided between Turov and Petrov, with Petrov being responsible for two of the ten chapters. The authors state that the aim of the book is to bridge the gap between scientists concerned with nuclear magnetic resonance and those concerned with problems in magnetism. They emphasize the microscopic advantages of the technique of NMR. Most of the interesting problems that have been and are continuing to be studied are treated at least briefly, and clearly, in the text. Included is a good deal of the original theoretical work that has been done by the Russian school in this field, some of it by Turov and his colleagues.

The emphasis of this book is on the theoretical discussion of static and dynamic properties of the nuclear spin system in a magnetically ordered material. The coupling of electron and nuclei is discussed very clearly in terms of the most fundamental and successful models. The relationship of theory to experiment is very clearly presented for the problems considered. Spin phonon interactions and nuclear and electron spin modes are discussed. The authors provide extensive discussion of the dynamic effect in the resonance frequency on both the electron and nuclear systems in antiferromagnets and in weak ferromagnets. They include also a brief description of nuclear acoustic resonance in magnetic materials. The book contains a very helpful chapter presenting a discussion of spin polarization at nonmagnetic ions largely applied to insulating compounds.

The text is an excellent introduction to its subject, highly recommended to both communities for which the authors intended it. One hope of the reviewer was to find a more complete discussion of the role of impurities in magnetically ordered metals as well as the relationship of such studies to direct measurements of spin polarization in alloys. Also worth adding to the text would be a discussion of hybrid methods of measuring hyperfine interactions. The authors are not to be blamed for this absence, inasmuch as these fields have been developing very rapidly since the original publication of the work in 1969. A valuable appendix is included, which is, however, not quite complete, largely because of the rapid expansion of experimental work in this field. Finally, this reviewer hopes to find in a future edition of this work extensive discussion of the contributions of Turov and his colleagues to the magnetic resonance problems for nuclei in multidomain materials.

The presentation is well suited for intermediate and senior-level graduate students interested in magnetism. The missing formula (5.81) on page 104 is contained in the Russian edition.

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