SCIENTIFIC BOOKS

THE RAT IN LABORATORY INVESTIGATION

The Rat in Laboratory Investigation. By JOHN Q. GRIFFITH and EDMOND J. FARRIS, editors, and thirty contributors. 488 pp. 178 illustrations. J. B. Lippincott Company, 1942.

THIS book, being the product of many workers, has all the strength and weakness of that form of writing. Each author treats his topic from his own point of view and with little regard for the contributions of the others. The chapters are therefore of very different lengths—5 to 76 pages—quite regardless of the relative importance of the topics, and the general treatment varies in the same way. Some of the chapters are excellent—others much less so, but in general the average is high.

An inspection of the various chapters shows that, with few exceptions, they are concerned with experimental procedures. The first of these, by Edmond J. Farris (17 pages), gives the standard procedures of the Wistar Colony, now perfected after years of experimentation. It is called "Breeding the Rat." The next, "General Methods," by John Q. Griffith (5 pages), which deals almost entirely with anesthesia, follows. Then comes one of the non-experimental chapters on "Gross Anatomy" (28 pages), by Eunice C. Green, a brief account of normal structures in preparation for later chapters. An introduction to the "Experimental Methods and Rat Embryos" (28 pages) by J. S. Nicholas comes next. This is largely an account of normal development. Then follows a treatise (36 pages) by Richard H. McCoy, dealing with the dietary requirements of the rat. In this the various substances are considered separately, with a summary at the end and a long, condensed bibliography. Following this is an account of the teeth (63 pages), by Isaac Schour and Maury Massler, including the effects of various agents upon their development. This has also a fairly long bibliography. Then comes a brief account (13 pages) by Thos. E. Machella and J. Q. Griffith on "The Digestive System," which is almost entirely experimental. This is followed by another account on "Metabolism" (13 pages), by C. Jelleff Carr and John C. Krantz—carbohydrate, fat nitrogen and respiratory metabolism—with reference, in the final sections, to the effects of operative procedures and drugs upon metabolism. A short chapter (8 pages) on the "Central Nervous System," by W. A. Jeffers, J. Q. Griffith and E. Roberts, deals with various operations. Then follows a long section (76 pages) on "Techniques for the Investigation of Psychological Phenomena," by George L. Kreezer, well organized alphabetically under headings, with cross references. This has the longest bibliography of any in the book. Next there is a chapter on the "Circulatory System" (17 pages), by J. Q. Griffith, W. A. Jeffers and E. Roberts, in which are considered various experimental procedures. A short chapter (7 pages), dealing with the use of the rat in biological assay, follows. Then comes a long chapter (55 pages) on "Dosage of Drugs," by Harald G. O. Holck and Donald R. Mathieson. This is largely a tabular arrangement, preceded by a discussion of some general conditions and followed by a long bibliography. The chapter on "Haematology of the Rat," by Adolph J. Creskoff (16 pages), takes up methods and draws comparisons with human blood. The fifteenth chapter deals with the use of x-rays (16 pages) and is largely a series of pictures. The next section deals with the topic of "Surgery" (19 pages), by Dwight J. Ingle, John Q. Griffith, W. A. Jeffers, M. A. Lindauer, H. U. Hopkins and Albert Segaloff, and presents a series of operations in detail. Then comes a chapter given to "Histological Methods" (7 pages), by W. H. F. Addison—fixing, imbedding and staining. "The Osseous System," which follows (22 pages), by R. M. Strong, is general in character and consists in the description of methods for gross and microscopic preparations. The chapter on "The Eye" is the shortest in the book (5 pages) and is by W. E. Fry. Then comes a section on the "Protozoan Parasites" (13 pages), by D. H. Wenrich, divided into those of the digestive tract and of the blood and tissues. Following this is a chapter on "Metazoan Parasites" (14 pages), by Herbert L. Ratcliffe, arranged according to the type of animal parasites. Finally there is a chapter on "Spontaneous Diseases of Laboratory Rats" (15 pages), also by Herbert L. Ratcliffe, in which are considered various rat diseases.

From this brief review it is apparent that the present work is a practical compilation of some of the more important phases of rat technique. It deals almost entirely with methods and procedures—it is a worker's hand book and, as such, forms an indispensable guide. In the very nature of its preparation it can not be complete and well rounded, and even, in the detail of bibliography, each author follows his own ideas. The many illustrations are good and the format and typography are excellent.

C. E. MCCLUNG

STELLAR DYNAMICS

Principles of Stellar Dynamics. By S. CHANDRASEKHAR. x + 251 pp. Illustrated. Chicago: University of Chicago Press. $5.00.

THE latest addition to the Astrophysical Monographs sponsored by the *Astrophysical Journal* is an important volume by Dr. S. Chandrasekhar, of the University of Chicago and the Yerkes Observatory. Through his studies of the dynamics of a rotating

galaxy and of the dynamics and statistics of encounters between stars Dr. Chandrasekhar has become one of the leading authorities in the field of galactic dynamics. In the new volume he has blended his own researches and those of others in a well-rounded book, which should for many years to come be "must" reading for every prospective student of galactic structure and dynamics.

The book opens with a chapter on "Kinematics." Beginning with a brief analysis and descriptions of the properties of stellar motions for the regions in the immediate vicinity of the sun, the author describes the phenomena of galactic rotation and of the asymmetry in stellar motions for high velocity stars. The chapter closes with a survey of the properties of external galaxies and a brief mention of some characteristics of star clusters.

In the second chapter, "The Time of Relaxation of a Stellar System," we find a clear discussion of the effects of stellar encounters. The presentation follows closely that of a series of papers by Chandrasekhar and Williamson. Even in the two-body approximation the problem is quite complex. No attempt has been made to extend the analysis so as to include the effects of multiple encounters by adapting the theory of fluctuations to the stellar case. A first trial in this direction has recently been made by Chandrasekhar and von Neumann, but the two-body approximation will probably remain important for rough estimates for many years to come.

The dynamics of a stellar system with differential motions, such as our own galaxy, is presented in the third chapter. The treatment follows closely that of the author and many astronomers will be delighted to have here an authoritative summary of Chandrasekhar's earlier papers.

The discussion of the dynamics of stellar systems is contained in the fourth chapter, in which special attention is given to the dynamical interpretation of spiral structure. The sections on Lindblad's theory of spiral structure, which present a fair and critical evaluation of current achievements and remaining difficulties, will probably be more widely read than any other part of Chandrasekhar's volume.

The book closes with a chapter on the dynamics of star clusters. The problem of globular clusters receives only scant attention, but the treatment of galactic clusters is quite complete and excellently written. In this chapter Chandrasekhar indicates in which way the theories for the dissolution of galactic clusters under the influence of the shearing forces of galactic rotation must be adapted in order to include the effects of encounters between cluster members.

At the conclusion of every chapter there appear bibliographical notes that contribute much to the general value of the volume. A detailed subject index and some appendices will undoubtedly prove very useful.

Chandrasekhar's volume comes at a time when there exists a real need for a book on stellar dynamics. Research in this field has recently developed along rather divergent lines and none of the books published during the past ten years has succeeded in providing a unified treatment. Chandrasekhar's book does this for the first time. Some of us who have worked in the field of galactic dynamics might here and there have preferred a somewhat different approach, but when it comes to judging the book as a whole we all pay our respects to the skill and insight of the author.

This book should exert a profound influence on the future developments in the field of galactic dynamics. I can recommend its study unreservedly to newcomers in the field and to those who already have a passing acquaintance with its problems. The experts can profit from reading it. If I were stranded in a far-off prison camp where I would be allowed one book I would ask for Chandrasekhar's volume. I am sure that per ounce of paper it would provide the most stimulation for continued research in theoretical astronomy.

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SPECIAL ARTICLES

TREATMENT OF EXPERIMENTAL RENAL HYPERTENSION WITH VITAMIN A

RECENTLY Pena and Villaverde reported favorable results in the treatment of essential hypertension in man with large doses of vitamin A orally.[1] Several case histories confirmatory of this finding have been reported to the senior author by medical colleagues. In view of these reports and the many similarities between experimental renal hypertension in the dog and essential hypertension in man, inclusive of a probable partial common pathogenesis, we have studied the effect of vitamin A by mouth in experimental renal hypertension in dogs. This report summarizes our preliminary results.

Five dogs were rendered hypertensive by the Goldblatt technique[2] and the resulting hypertension was permitted to stabilize over a period of five to eight months. Mean blood pressure readings were obtained by puncture of a femoral artery two to three times a week. Studies on the blood urea nitrogen, urinalyses and determinations of body weight were made at monthly or bimonthly intervals. Three of the dogs

[1] J. Govea Pena and M. Villaverde, *Rev. Cubana Cardiol.*, 2: 322, 1940.

[2] H. Goldblatt, J. Lynch, R. F. Hanzal and W. W. Summerville, *Jour. Exper. Med.*, 59: 347, 1934.