

gives useful sets of worked examples. These examples are perhaps the most valuable part of the book. They are clearly and logically set out and will certainly prove a useful guide to those wishing to have a cookbook outline of statistical methods. It would be wise, however, to take care in using the sections described as "instant" and "short and dirty".

The book outlines practical calculations of standard deviation, variance ratio, *t*-tests, correlation, factorial designs, analysis of variance and data transformations. Chapter six, on experimental design, is particularly clear and interesting. There is a glossary of statistical terms and abridged statistical tables are included.

L. SAUNDERS

GENE CONTROL

Gene Activity in Early Development

By Eric H. Davidson. Pp. xi+375. (Academic Press: New York and London, February 1969.) 116s 8d.

THE subject of this book is of considerable interest at the present time. This is partly because work in the past ten years has shown that greater natural fluctuations in gene activity take place in early development than at other stages of life, and partly because the extent to which changes in gene activity are responsible for cell differentiation can be very profitably explored in situations where cells undergo differentiation but little if any growth; this happens in the early development of most animal eggs, but in very few other circumstances.

The experimental analysis of early animal development is not itself a new subject. A fundamental principle of development, the existence of a relationship between unequally distributed materials in an egg and the nature of subsequent cell differentiation in an embryo, was established over 40 years ago. The analysis of how these regions of egg cytoplasm exert their effect on development, however, has been severely restricted, until recently, by the lack of any criteria, other than cytological, by which to recognize changes in nuclear or gene activity. Within the last ten years current methods of molecular and cell biology have permitted the direct identification of gene products. This book provides an excellent summary of the extent to which recent work of this kind has so far helped to elucidate the events that take place during animal development and the mechanism of the processes involved.

The book is divided into four sections. The first describes changes in the synthesis and use of gene products from fertilization through early development. Section two concerns the localization of cytoplasmic materials and their relationship to cell differentiation. Section three describes in detail the changes in nuclear expression which accompany the growth of the oocyte and the formation of the egg. Lastly, section four discusses at length the variable life of messenger RNA molecules and compares gene regulation in bacteria and animal cells. The book is very largely concerned with amphibian and sea urchin embryos, an emphasis which is justified by the relative sparsity of information on the molecular basis of early development in plants and other animals.

In addition to summarizing the results obtained with molecular hybridization and other modern techniques, considerable space is very appropriately devoted to much older descriptive and experimental work on a variety of animal embryos not so far subjected to biochemical analysis. The approach adopted has been to assemble and coordinate a wide variety of results and to keep to a minimum any discussion of the validity of the original authors' conclusions. Thus readers who wonder about the mechanism of gene control in early animal development will find their speculations largely unimpinged upon by views of the author. For this reason the book will

have special appeal to research workers and advanced students, who will find an invaluable guide to important experiments in the field and will appreciate 650 references extending to the beginning of 1968. Among the special merits of the work are the inclusion of frequent summaries at the ends of sections and a full appreciation of the earlier work which has laid the foundation of embryology and much of which is so easily overlooked with the advent of new methods of analysis.

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MAMMALIAN REPRODUCTION

Traité de Zoologie

Anatomie, Systématique, Biologie. Publié sous la direction de Pierre-P. Grassé. Tome XVI: Mammifères. Fasc. VI: Mamelles, Appareil Génital, Gamétogenèse, Fécondation, Gestation. Pp. 1028+1 plate. (Masson et Cie: Paris, 1969.) 280 francs.

THIS is a new and valuable addition to a famous series. The book deals exhaustively with the mammary glands and genital organs, efficiently with gametogenesis and fertilization, briefly with gestation—and surprisingly (in view of its title) with chromosomes and chromosomal evolution.

Treatment of mammary glands and genital organs occupies three-quarters of this weighty volume; it is mostly the work of Albert Raynard, but includes a chapter on the ovary by Robert Courrier. The mammary glands are dealt with comparatively, from the aspects of morphology and development, together with the cytology and histochemistry (but not ultrastructure) of milk secretion. (Lactation is not considered.) Anomalies and induced changes are also discussed. The bibliography of about 150 references is divided according to the arrangements of subject matter, which is convenient, but it is notable that only five references are in the 1960s. The chapter on the genital organs is a treatise in itself—487 pages—about half of it on anatomy and histology, and the remainder on embryonic development and its anomalies, in monotremes, marsupials and placental mammals. (Freemartinism is described, but not cell mosaicism.) The material is clearly and systematically set out, and lavishly illustrated with more than 400 line drawings and half-tones. The morphology section must represent the fullest description yet published on this subject.

Courrier's account of the ovary relates to ovarian and follicular development, ovulation, and corpus luteum formation, to the endocrine background of these events, and changes in the genital tracts. He discusses briefly the ovotestis, the senile ovary, androgen production by the ovary, oral progestogens, and pheromones and the Whitten and Bruce "effects", but there is no word on luteolysins. The bibliography is strange: it lists only three of the many references in the text, but thirty-odd other works bearing on the subject.

The remainder of the book is largely occupied by chapters on gametogenesis, maturation and fertilization by Charles Thibault, and on gestation by Courrier. Thibault's chapters are clearly set out in the modern idiom with well organized, critically appraised information. Subjects receiving attention include the rate of passage and resorption of spermatozoa in the epididymis, capacitation and decapacitation, and the distribution and longevity of gametes in the female tract. Tabulation and illustration of data are very adequate and helpful. Extensive bibliographies are appended to each chapter.

Courrier's second chapter, "Gestation in Placental Mammals", is short (29 pages). It is concerned with the role of hormones in embryo transport and implantation and in pregnancy and parturition. There are brief sections on delayed implantation and on extra-uterine