biochemistry. The fundamental phenomena studied in genetics and biochemistry seem to be similar or identical in all organisms. The facts mentioned in the last chapter, particularly the selection experiments involving canalization which Waddington has initiated, may suggest that different mechanisms, as indicated by their polygenic determination, may be involved in the control of each developmental process. If this were the case, the physicochemical mechanism of control of a process would be variable, while the more generalized answers would have to be sought in evolutionary considerations.

Unfortunately, the book contains many typographical errors, some of which interfere with easy understanding. However, the large number of illustrations help clarify the observations and interpretations. Twenty-four plates, many of them electron photomicrographs, are included.

All biologists should find the book pleasant, profitable reading, and it will be particularly valuable to those interested in problems of development. By evaluating critically the difficulties and the promises involved in the transfer of ideas from the study of microorganisms to developing metazoan systems, the author has formulated a large number of questions that can be profitably attacked with the means at our disposal.

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Plant Genetics

Discussions in Cytogenetics. Charles R. Burnham. Burgess, Minneapolis, Minn., 1962. iii + 375 pp. Illus. \$8.

Discussions in Cytogenetics, according to Burnham, is intended for use in an advanced course in cytogenetics, one which follows courses in cytology and genetics. He further indicates that "it is a supplement rather than a substitute for other books in the field." It should also be pointed out that the manipulation of chromosomes and genomes via correlated genetical and cytological experimental procedures constitute the core of the book.

Plant breeders and cytogeneticists will welcome the publication of this book, a compilation of Burnham's lecture notes at the University of Minnesota where he is a professor of plant genetics. Burnham proposes that the book will "aid in attaining a working knowledge which will enable the student to read and understand the published research as it appears."

The book is divided into two general sections: (i) changes in chromosome structure and (ii) changes in chromosome number.

The first section, on structural changes in the chromosomes, is subdivided into chapters dealing with these topics: deficiencies, duplication, inversions, interchanges, and *Oenothera* cytogenetics. In this area the author, through his own efforts and those of his students, is a major contributor. There is a careful weaving of information, from a varied group of organisms, that should aid in the interpretation of significant phenomena in each particular subject. Both sections are particularly useful for their elucidation of detailed methods of handling various chromosomal aberrations and for information derived from these. Relevant data and interpretive diagrams will help the breeder and geneticist who is confronted with such problems in his cultures. There is a great reliance on the experimental results derived from maize cytogenetics.

In the second section, on changes in chromosome number, the author includes chapters that survey the experimental procedures and results in the areas of aneuploidy, autopolyploidy, allopolyploidy, and the applications of polyploidy. Geneticists and plant breeders working with polyploids will be especially interested in these chapters, since the author has elaborated on topics such as "maximal equational segregation," an important aspect of autopolyploidy. Burnham suggests that, since there is so little difference between final theoretical ratios based on different types of segregation, there is a need for additional experimental support of dubious ratios in the form of an F_3 generation. Clarification is also given the frequency term *alpha*.

There is an introductory chapter on linkage and chromosome behavior, and there are additional chapters on sex determination and apomixis. Also included is an appendix of suggested problems that should give students adequate opportunity to explore and utilize the book's contents. An extensive index is included and, in addition, approximately 1300 references are cited. A perusal of these references will acquaint one with the major and pioneer contributors to the field.

This book is recommended to all workers in the area of plant cytogenetics. It contains a thorough coverage of considerable cytogenetic information which the thoughtful and interpretive student will find useful in developing and projecting his own ideas in further experimentation.

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Human Reproduction

Science and the Safe Period. A compendium of human reproduction. Carl G. Hartman. Williams and Wilkins, Baltimore, Md., 1962. xii + 294 pp. Illus. \$12.

The control of human reproduction is a matter of paramount importance to the interests of the human race. It is indeed timely to review the extensive literature about mammalian reproduction, with special reference to man, and to critically evaluate the application of our knowledge to this problem. The author, Carl Hartman, has devoted his entire professional life to the study of mammalian reproduction and his outstanding contributions have stimulated many scientists to interest themselves in this field; thus, he is superbly suited to write this classic volume.

The initial chapters provide background information concerning the physiology of human reproduction. The origin, growth, and development of the ovum and the spermatozoon and their transport into the fallopian tube are described. The comprehensive review of spermatogenesis, the seminal fluid, and normal and abnormal spermatozoa provide much information concerning the male factor in fertility. The normal role of the sex steroids in controlling cyclical changes in the reproductive organs are reviewed.

Ovulation holds the key to our present interest in the control of fertility in women. It is not surprising that the major part of this book is devoted to a discussion of ovulation and of our knowledge concerning its accurate timing. Hormonal studies, changes in the cytology of the vagina, the cervical mucus, and the endometrium, and clinical manifestations such as the basal body temperature changes and "mittelschmerz" are evaluated as criteria