many, if not most, crimes are committed by individuals in whom the role of heredity is minor, nonspecific, or perhaps irrelevant." Criminality is clearly genetically heterogeneous. Strangely enough, we are here sometimes better able to form an idea of what is inherited and how it interacts with the environment than we are in the functional psychoses. Electroencephalographic and chromosomal abnormalities, low IQ, and psychopathy, some of it under genetic influence, play their part in predisposing to crime.

The author is to be commended for the number of studies he has presented and discussed, reasoning about them step by step, rather than to be criticized for omitting others in his attempt to cover a very wide field. The book was originally intended for students of abnormal psychology, but it will be of equal value to their teachers and to professional workers in the field. It deserves to be widely read, and one hopes it will achieve the author's primary goal, "to get students to see the great, untapped potential in this immature field, and to stimulate a few to take an active interest in advancing it further."

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Reproductive Entomology

The Physiology of Insect Reproduction. FRANZ ENGLEMANN. Pergamon, New York, 1970. x, 308 pp., illus. $18.75. International Series of Monographs in Pure and Applied Biology, vol. 44.

It has been becoming more and more apparent in recent years that the variety of reproductive patterns and underlying physiological control mechanisms found in the class Insecta rivals and may well exceed that found in the vertebrates. This book is one of the first attempts to treat insect reproduction in a comprehensive manner. Engelmann has performed an important service in bringing together the diverse and widely scattered literature of this field. Topics covered in his review include sex determination and sex differentiation, gonadal development (spermatogenesis, oogenesis, and vitellogenesis), mating behavior and the control mechanisms involved therein, insemination, factors affecting fecundity, hormonal control of egg maturation, neuroendocrine integration of reproductive processes, parthenogenesis, oviposition, viviparity, hermaphroditism, heterogony, endocrine influences on reproduction in males, and caste determination and control of social structure in social insects. The chapters on gonadal development, mating, fecundity-affecting factors, and hormonal control of egg maturation, which make up the bulk of the book (148 of 243 pages of text), are of the greatest interest not only because these topics have captured a major share of the attention of investigators in recent years, but also because of the substantial contributions to these areas arising from Engelmann's own research.

This reviewer found the chapter on mating to be the least satisfactory one in the book. It is, as the author points out, "a formidable task to extract the essentials" from the vast literature on this subject, and the material presented on this topic seems somewhat less well digested than that presented in other chapters. The minor errors and omissions that occasionally frustrate the reader seem more numerous here than elsewhere in the book. Engelmann cautions repeatedly and wisely against generalizing on the basis of evidence from a few species, yet on occasion he fails to heed his own warnings. For example, experiments on certain laboratory strains of the cockroach *Leucophaea maderae* indicate that the corpus allatum hormone is important in enhancing the sexual receptivity of females, and the author concludes that in cockroaches "the corpus allatum hormone affects the central nervous system, thus changing the female's behavior." Yet other data exist (not all of which are cited) indicating that in other strains of *Leucophaea* as well as in two other cockroach species, hormones from the corpora allata have a negligible effect on female sexual receptivity. A tendency on the part of the author to give top billing to his own interpretations of the processes regulating insect reproduction, and in so doing to ignore data suggestive of other interpretations, appears in the chapter on hormonal control of egg maturation as well as in the one on mating; I did not note it elsewhere. The only other criticism to be made of this book concerns the inordinate amount of time between the completion of the literature survey (1968) and the publication of the book. As a result the book is out of date on a number of points; indeed, some of the issues raised by Engelmann have been substantially resolved in the interim.

The book is quite well illustrated, the illustrations generally serving to enhance the text. There is an adequate index listing both species and subjects, an extensive bibliography, and a brief but useful glossary.

If the foregoing criticisms are borne in mind, this book is an extremely useful survey of the literature of insect reproduction. A careful reading of it should be of particular benefit to students interested in doing research in insect reproduction, for Engelmann takes care to point out subjects in need of further investigation, not only among topics of current interest but also among those that are currently rather neglected, such as sex differentiation (thought to be under strict genetic control until the recent demonstration of the importance of epigenetic factors in certain beetles), endocrine influences on reproduction in male insects, the physiology of oviposition, and caste determination in social insects (a topic that formerly commanded considerable attention). It is to be hoped that the book will serve as a stimulus to research in these and other areas of insect reproductive physiology.

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Germ Cells

Ovarian Development in Drosophila melanogaster. ROBERT C. KING. Academic Press, New York, 1970. x, 228 pp., illus. $16.50.

This volume is based on the work of King and his collaborators on germ cell proliferation and development in *adult* female *Drosophila.* As an organized presentation of this work, it will be of value to geneticists and developmental biologists who use this species. The author's aim, "to summarize information on how reproduction is accomplished and regulated in this species," emphasizing the analysis of the developmental failure of female-sterile mutants, has been accomplished in part. However, he has failed to produce a comprehensive treatise on the germ cells of female *Drosophila.*

Good account is given of the structure and functioning of the adult ovariole. A detailed, tabular description of the morphologically defined stages of oogenesis is made, and later stages are well illustrated by semidiagrammatic drawings. Rates of growth of egg chambers, nurse cells, and oocyte are given, along with the temporal relations for actively laying, mated females.