Developmental Nutrition

Development of the Functions of the Small Intestine in Mammals and Man. O. KOLDOVSKY. Karger, Basel, 1969 (U.S. distributor, Phiebig, White Plains, N.Y.). viii + 204 pp., illus. $12.70.

The epithelium of the small intestine has been attracting increasing attention in recent years because it provides a useful material for studying on the one hand patterns of enzyme differentiation and their control and on the other the relation of enzymic differentiation to the functions of digestion and absorption. The Laboratory of Developmental Nutrition of the Czechoslovak Academy of Sciences in Prague has been a leading center of work along these lines, and in *Development of the Functions of the Small Intestine in Mammals and Man* Koldovsky, former director of the laboratory, summarizes the investigations carried out there between 1958 and 1966.

The greater part of the book is devoted to the digestion and absorption of the major foodstuffs in the rat from birth to adulthood. Other laboratory animals are included, however, and fetal development is not neglected. The problem of carbohydrate digestion and absorption in nurslings has especially concerned the author and his many able and enthusiastic young co-workers, and one of the most valuable chapters in the book deals with their findings on that topic. In several animals, they have shown that the infant intestine transiently produces a beta-galactosidase that cleaves milk sugar; they have demonstrated that this activity is directly related to the capacity for lactose absorption, and have also found that the pattern of beta-galactosidase production is at least partly dependent on the secretion of adrenal corticoids. Similar evidence, as far as available, is also presented for intestinal lipases and peptidases. Reflecting Koldovsky's interest in clinical problems, there is a chapter on evidences of functional differentiation in human fetuses and newborn infants.

This monograph is, however, more than simply a recital of the findings of the author's research group, for work from other laboratories is presented in ample detail. Among the most useful features of the book, in fact, are its inclusion of numerous studies published in European journals not well known in the United States and its coverage of the historical background of the past 90 years. The bibliography includes more than 600 items. There is no index, but this deficiency is partly compensated for by a detailed table of contents.

Well illustrated and written in the author's own simple and straightforward English style (which should serve him well in this country, to which he moved soon after the unhappy events of August 1968), the presentation is always clear and easy to follow. The book will be of value both to developmental biologists interested in the course of biochemical and physiological events in early life and to pediatricians and others concerned about the medical problems implicit in the patterns of intestinal differentiation.

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Hormones and Behavior

Endocrinology and Human Behaviour. Proceedings of a conference, London, May 1967. RICHARD P. MICHAEL, Ed. Oxford University Press, New York, 1968. xviii + 350 pp., illus. $18. Oxford Medical Publications.

The 18 papers in this book are by some of the leading investigators in the field, and they are generally of high caliber. The makeup of the book reflects that this is a relatively young field. It contains a number of good general reviews of specialized endocrine systems which serve as background information and a few papers dealing with endocrine-behavior relationships in animals. Somewhat fewer than half of the papers deal with studies of the human. The book contains much useful old and new material and is well organized.

Because of the specialized interests of the planners of the conference, there is more emphasis on pituitary and gonadal than on thyroid and adrenocortical relationships to behavior. The papers that deal with endocrine-behavior relationships naturally fall into two categories: how hormones influence behavior, and vice versa. These were the papers that seemed particularly important to this reviewer, and they will be discussed in more detail.

The effects of antenatal androgens on behavior in the monkey are discussed by Goy and in the human by Money. The critical period for the effect of androgen appears to be much earlier in these species than in rodents. The exposure of pregnant monkeys or women to excessive androgen causes the female offspring to have a number of male behavioral characteristics. The monkeys demonstrated more male sexual behavior, whereas the girls, though "tomboyish," did not give any evidence of altered sexual orientation to produce more lesbianism. The data emphasize the paramount importance of environmental factors in sexual orientation in the human.

Money has found that girls exposed to high androgens (congenital adrenal hyperplasia and progestin treatment) in utero tend to have high I.Q.'s whereas girls who congenitally lack ovaries do not. He proposes the possibility that "a flood of fetal androgen may in some way be beneficial to I.Q." Obviously, if such a relationship does exist it also involves other variables, since if androgen were the only factor boys would automatically be brighter than girls—a rather difficult position to support.

The papers of Michael and Hamburg, which complement each other, concentrate on how hormones influence behavior postnatally. Michael describes the pattern of sexual activity in rhesus throughout the menstrual cycle. The high level of sexual activity at ovulation and the subsequent decline are due both to changes in receptivity of the female and changes in interest in her of the male. Both of these variables are dependent on the female's ovarian steroids. The signal to the male of the female's receptivity appears to be a pheromone which requires the male's sense of smell for recognition. The paper of Hamburg includes a good study of changes in a number of psychological and behavioral factors throughout the human menstrual cycle and during treatment with different types of oral contraceptives. Here, too, it is evident that the pattern of ovarian steroids is a basic determiner of subjective and objective changes in the human female. Changing of ovarian hormone levels by the oral contraceptives alters psychological reactions, and the pattern of these alterations is related to the composition of the contraceptive. In view of Michael's work, one wonders if cyclic changes in the man's interest also occur.

The converse question, What do psychological changes do to hormones?, has also produced some good papers.