

world at large are interested in the human than in any other single species.

The histochemistry of secretory products in the cells is dealt with by Gabe, and the distribution of enzymes, especially cathepsin, by Pearse and Van Noorden. Some excellent electron photo-micrographs of the secretory process and of the various cell types are given by Herlant and by Barnes. One does, however, wonder whether the confident differentiation of, for example, the luteinizing hormone cell and the growth-stimulating hormone cell in Mrs. Barnes's Fig. 12 is quite justified: the two cell types appear very similar in the photograph.

Desclin described some very elegant grafting experiments in which portions of pituitary were implanted in the hypothalamus itself, and these confirm the important findings of Halász that contact with the portal hypophyseal vessels themselves is not necessary for retention of pituitary function under these conditions. Of similar interest is the account by Bogdanove of intrapituitary grafts of target organs or hormones, which lead to the conclusion that the feed-back mechanism can act, in any event in part, directly on the pituitary itself.

Ezrin and Murray give an excellent summary of cytology of the normal and pathological human gland. The allocation of function to the cell types is a very difficult problem and some doubt still remains. For example, it is stated (p. 195) that the delta 1 cell, identified as a gonadotrophin producer, is scanty or absent in old people or chronic illness. It seems to be implied that such patients do not produce gonadotrophins, but, in fact, daily excretions of more than 30 International Units of human menopausal urinary gonadotrophin are quite often found in women over 60, even if they are chronically ill.

A series of papers describe the comparative aspects. Legait measured the relative volumes of the intermediate lobe in many mammalian species and demonstrated a correlation with the water environment of the animal, while the detailed cytology of the intermediate lobe is dealt with by Purves and Bassett. The adenohypophysis of birds is described by Wingstrand and by Tixier-Vidal, of reptiles by Saint Girons and by Grignon, of amphibia by van Oordt and of fishes by Oliverau and by Stahl.

Finally, there is a very useful bibliography compiled by Da Lage.

All who are directly interested in this subject will wish to read this volume. When eventually a standardized system of nomenclature is evolved, it is certain that its authors will owe a heavy debt to the editors and authors of this valuable contribution.

J. C. DAVIS

CYTOLOGY AND GENETICS

The Matter of Mendelian Heredity

By Dr. K. R. Lewis and Dr. B. John. Pp. 269 + 15 plates. (London: J. and A. Churchill, 1964.) 40s. net.

THE authors write with zest and evidently enjoy their subject. The colloquialisms, the light-hearted and alliterative chapter headings, and the *double entendre* in the title are welcome departures from the usual dead-pan exposition of science. On the other hand, the method of writing occasionally obscures the meaning, and will puzzle many a reader mightily. Strange facts and figures, such as the sum total of about 0.02 g of DNA in all the zygotes which gave rise to the present human population, are not without their uses in helping one to visualize the dimensions of the subject. There is a healthy interest in the actual process of research. Undoubtedly, the book is stimulating, and is meant to stimulate both teacher and student.

The introductory chapter is mainly about types of reproduction, cell division, fertilization and particulate heredity. In this chapter, there is no clear lead as to how one scores the number of chromosomes during meiosis.

A complication exists, of course, since chromosome replication and centromere division are asynchronous. But, if the phrase "number of chromosomes" is to be given meaning, we must decide on some way of counting, and the simplest way is to count the number of centromeres. On this definition, chromosome number is halved at the first meiotic division, though this is not what the authors conclude on p. 49. Next, a statistical section is followed by a short discussion of gene action and interaction, and then by an integrated treatment of the reproductive and genetic systems. Genetic change (mutation, selection, evolution) is then considered. Cytological technique is illustrated by an excellent series of photographs showing mitosis in the crocus and meiosis in a grasshopper. In the penultimate chapter there is an account of the chemical basis of heredity. This, it is interesting to note, is the one chapter that "the elementary reader can safely leave unread", and "the authors thought more than twice about including it at all". This apparent heresy can be respected. In our present state of knowledge the link between low-level concepts such as molecular structure, and high-level ones such as behavioural patterns or geographical distribution or rate of selection, is often extremely tenuous.

The final chapter about the scientific method includes a certain support of teleology. Again, this can be respected. Teleological statements are now coming back into use, though the scientific reaction against them was at one time almost absolute. Nowadays, they are no more than a form of shorthand. We might say, teleologically, that "a giraffe has a long neck because it is of selective advantage", but we can translate this into terms of material and efficient causes by writing instead "once upon a time some short-necked animals developed mutations lengthening the neck, were then able to exploit a new food source, and natural selection..." and so on. A teleological statement saves words.

There are short lists of references and selected reading, and an adequate index.

R. A. BEATTY

EVOLUTION OF CROP PLANTS

Essays on Crop Plant Evolution

Edited by Sir Joseph Hutchinson. Pp. vii + 204 + 16 plates. (Cambridge: At the University Press, 1965.) 50s. net; 9.50 dollars.

THE excellent essays presented in this volume are based on nine lectures, each by an acknowledged expert, given at the University of Cambridge during 1962. The text deals not only with genetical and phylogenetical aspects of plant evolution, but also with the interdependence of the social and cultural history of man and the emergence of his food crops. Thus the book is certain to have a wide appeal to botanists, agriculturists, archaeologists and social historians.

Prof. H. Godwin contributes a fascinating introductory chapter in which he presents a glimpse of the timing and scale of the beginnings of agriculture in north-west Europe. The evidence, based largely on analyses of fossil pollen from different sedimentation layers, suggests a massive wave of tree clearance and of subsequent land utilization for agriculture in north-west Europe at about 3000 years B.C., coinciding with the advent of the early neolithic cultures. The scale envisaged of the forest-clearing operations by widely scattered settlements of primitive, early neolithic man can only be described as truly astonishing.

This introduction is followed by a chapter by Dr. P. C. Mangelsdorf on the origin of maize, in which the evolutionary significance of fossil maize cobs uncovered at Bat Cave in New Mexico, and dating from about 3600 B.C., is discussed. The author reaches the conclusion, which is supported by an ingenious reconstruction of primitive maize using the dominant gene tunicate (*Tu*), that modern