LYMPHOCYTE EXCHANGE

Die Physiologie des Lymphozytenwechsels und seine Beeinfluhbarkeit durch Hormone des Hypophysen-Adrenal-systems. Von Priv. Doz. Dr. H. G. Hansen. 1958. VIII, 164 Seiten, 74 teils mehrfarbige Abbildungen, Gr.-8°, kartoniert DM 18.50. Stuttgart: Georg Thieme Verlag.

Inhaltsverzeichnis: Geleitwort. Einleitung. I. Untersuchungen zur Physiologie des lymphatischen Systems. II. Die Anwendung von Indikatorverfahren für Untersuchungen. III. Einflüsse des adrenocorticotropten Hormons der Hypophyse un der Glukocorticoide auf den Lymphozytenwechsel. IV. Übersicht der Ergebnisse. V. Zusammenfassung. Literaturverzeichnis.

The term 'Lymphozytenwechsel' means the formation of lymphocytes and their life-cycle. The author tries to get new results in draining the thoracic duct of the cat by marking the lymphocytes with P_{32} and with fluorescent dyes.

He mentions the action of ACTH and Cortisone in cases of leukaemia and gives a good review of the literature and confirms the well-known facts that the glucocorticoids inhibit the synthesis of proteins and depress the formation of lymphocytes.

H.W.

EFFECT OF RADIATION ON HUMAN HEREDITY

Effect of Radiation on Human Heredity. Report of a Study Group convened by WHO together with Papers presented by Various Members of the Group. Pp. 168. Figures. £1. Geneva. World Health Organisation. 1957.

Contents: Part I. Report of Study Group. Report of Study Group on the Effect of Radiation on Human Heredity. 1. Introduction. 2. Natural and man-made sources of ionizing radiation. 3. Importance of recording radiation exposure in individuals and populations. 4. Research. 5. Some conclusions. Annex. List of participants. *Part II. Papers presented at Study Group.* Damage from point mutations in relation to radiation dose and biological conditions—*H. J. Muller.* Types of mutation at known gene loci and possibility of hitherto unrecognized mutations being induced. Irradiation of animal populations: results and work needed—*T. C. Carter.* Some of the problems accompanying an increase of mutation rates in Mendelian populations—*Bruce Wallace.* Exposure of man to ionizing radiations, with special reference to possible genetic hazards—*R. M. Sievert.* Detection of induced mutations in offspring of irradiated parents—*J. Lejeune.* Gonad doses from diagnostic and therapeutic radiology—*W. M. Court Brown.* Mutation in man—*L. S. Penrose.* Possible areas with sufficiently different background-radiation levels to permit detection of differences in mutation rates of 'marker' genes—*A. R. Gopal-Avengar.* Comparisons of mutation rates at single loci in man—*A. C. Stevenson.* Some problems in the estimation of spontaneous mutation rates in animals and man—*James V. Neel.* Effect of inbreeding levels of populations on incidence of hereditary traits due to induced recessive mutations—*N. Freire-Maia.* Detection of genetic trends in public health—*Harold B. Newcombe.*

It might be wondered why it was necessary to produce yet another study on the effects of radiation on man, so soon after the publication of two important British and American studies, namely *The hazards to man of nuclear and allied radiations*, published by the Medical Research Council of Great Britain (1956) and *The biological effects of atomic radiation*, published by the U.S. National Science Foundation (1956). Both studies, though differing characteristically in emphasis and tone, had started out by assuming that the effect of increased radiation in man is to increase the mutation rate. Thereafter, both had conceived it as their primary problem to assess the hazard, for future generations, of such increased mutation rates. They had chosen an arbitrary standard, the *doubling dose*, that is, how much extra radiation, over and above the present background radiation, is necessary to double the mutation rate of any gene.

The justification for the present work lies in its fulfilment of its stated purposes, viz. to obtain opinions from other countries than the U.S.A. and Britain, and to concentrate upon the gaps in present knowledge and thus suggest what lines of research should be followed to increase understanding of the genetic effects of

ionizing radiations on man. Accordingly, in August 1956, the World Health Organisation brought together at the University of Copenhagen experts from Brazil, Canada, Denmark, France, Germany, India, Italy and Sweden, as well as the United States and the United Kingdom. Their deliberations have resulted in the present book.

It must be stated at once that by emphasizing the many unsolved problems, the Study Group have brought a sobering element of balance into a problem which the earlier publications had reflected in a somewhat lopsided fashion. Anyone familiar with recent trends in genetical thought would have realised long since that the very basis on which the estimated 'doubling dose' was calculated was most tenuous; further, the stress laid on the population effects of an increased mutation rate tended to ignore the modern concept of *balanced polymorphism,* whereby a mutant gene is maintained in a population for a favourable heterozygous effect, despite an adverse homozygous effect. A human example of this phenomenon may well be the possible anti-malarial effect of the sickle-cell gene in single dose, as contrasted with the pathological effects of the homozygous gene in producing sickle-cell anaemia. The mechanism of such balanced polymorphism is not readily upset by an increase in mutation rate, as Wallace and Neel are at pains to indicate.

It is impossible here to review in detail the many valuable contributions to this symposium, the wide scope of which is suggested by the chapter headings listed above. It should be mentioned, however, that two general steps are recommended towards minimizing the dangers to descendants—*reduce exposure,* and *seek more knowledge about the effects of exposure.* In the latter regard, the Study Group lists thirteen major gaps in present knowledge, under the headings of radiation research and human genetical research, ranging from the mode of gene action and the mapping of human chromosomes to twin studies and patterns of mating in man. James V. Neel of the University of Michigan makes this appeal:

> 'When considering the genetic impact of increased exposure to ionizing radiation, we should prefer not to attempt to extrapolate from other species to man, but rather to base our thinking entirely on human data. Unfortunately, as has already become abundantly clear, the necessary data on man are not yet to hand, nor is it likely that they will be for some time to come.'

Finally—and we in South Africa, who were not represented at the Copenhagen Conference, might do well to ponder this—the Group concluded that there are too few institutions or large university departments devoted to general genetics and even fewer to human genetics. 'Medical undergraduates should all receive training in genetics.' The reviewer feels strongly that the time is long overdue for the establishment at South African medical schools and teaching hospitals of heredity clinics and counsellors and of systematic courses in human and clinical genetics. Perhaps the increasing radiation hazard may have as one constructive side-effect a new interest on the part of the medical profession in the problems handled with such admirable objectiveness in this valuable W.H.O. publication.

P.V.T.