

genetics held in Glasgow in June 1966. Though much of the data have already been published in a variety of journals, the present work is a useful summary of the present situation in this important field. With the exception of one chapter on auto-immune disease in inbred mice, the volume is devoted to the study of clinical problems. The subjects include family studies in patients with thyroiditis, rheumatoid arthritis, iron-deficiency anaemia, lupus erythematosus and other connective tissue disorders, and the incidence of auto-antibodies in twins. There is a particularly pertinent chapter on the pitfalls of genetic studies as illustrated by a review of the 17 studies conducted on patients with rheumatoid arthritis in whom familial aggregation has been reported. Deficiencies in the criteria for selection of the patients are analysed and the too ready acceptance that familial aggregation of cases necessarily implies a genetic basis of the disorder is critically discussed. Clinicians of many disciplines will find this volume of value.

J. H. THOMSON

Phenotypic Expression. Immunological, Biochemical, and Morphological. A Symposium Organized by Milton N. Goldstein, San Francisco, May 31–June 3, 1966. *In Vitro*, Vol. 2. Tissue Culture Association, Inc. (Pp. xi + 170; illustrated + tables. 87s. 6d.) Baltimore, Williams & Wilkins; Edinburgh: E. & S. Livingstone. 1968.

'*In vitro*' is the vehicle by which the American Tissue Culture Association publishes invited papers at its annual symposium and also the abstracts of proffered papers. This volume, which records the 1966 meeting, is of particular genetical interest in that the papers were designed to examine various types of phenotypic expression of genes studied at the molecular and structural level. It also contains the Association's report on their proposed terms for use in relation to animal tissue culture; these include their definitions of cell strain; clone; diploid cell line; euploid, mixoploidy; endopolyploidy; and toxicity. The last definition is particularly unusual since it can include change of the rate of growth of cells.

Many of the proffered papers are of a high standard. It would have been helpful if these abstracts carried references to work quoted.

The invited papers are exceptionally good. Hirschhorn gives fascinating evidence that small lymphocytes produce various antibodies, and he relates this ability to the function of their lysosomes. Hiramoto and Hamlin give detailed investigations of the possibility that any one cell may produce two different antibodies, and they discuss the genetical problems involved in such a possibility. Ephrussi's communication deals with somatic hybrids between hamster and either rat or mouse cells, and proves the hybridization by karyological analysis and by the analysis of the LDH proteins they produce.

Ohno gives both karyological and genetic evidence for somatic segregation in many animals; apparently only certain chromosomes are involved in such segregations. In mammals, it is particularly the splenic cells that show

this phenomenon, and he speculates on how this may affect immunologically competent cells. Black reports that DNA, isolated from oncogenic virus, can induce the host cell to produce the specific antigen which is found when the cells undergo a malignant transformation. It is left open whether this is due to the integration of the viral DNA into the genome of the host cell, or whether it is due to specific derepression of the host cell's genome, as Green suggests in his article. Franks points out the need to study the antigens present on cultured cells because of their importance for genetic studies on somatic cells; but apparently almost all cell lines contain some cells that are antigen-negative as well as those that are antigen-positive. While Franks discusses the role of aneuploidy in this apparent anomaly, Merchant and coworkers show that cells can lose their surface antigens when grown in culture.

Krooth's communication describes two selective systems for culturing human diploid cells, which allow the detection of genetic change at some Mendelian loci. He gives evidence for the existence of two types of acatalasia and in glucose-6-phosphate dehydrogenase deficiency, which can be detected in diploid cell strains grown in culture. His results on galactosaemia and on orotic aciduria are given in some detail. De Mars and Leroy show the value of phase-contrast microscopy for screening tissue cultures, and describe abnormal cells in a case of Hurler's disease; they suggest that the Hurler-Hunter disease could be a genetic defect of the lysosomes. Though their histochemical evidence leaves much to be desired, their culture methods are of interest.

JOSEPH CHAYEN

Primates in Medicine. A Series in Experimental Medicine and Surgery in Primates, Vol. 1. First Holloman Symposium on Primate Immunology and Molecular Genetics. Edited by C. H. Kratochvil. (Pp. xv + 99; 33 figures + 28 tables. S. Fr./DM. 16.50; \$4.00; 30s.) Basel, S. Karger. New York. 1968.

This is a report of a symposium, held in the United States in 1966, on the immunology and molecular genetics of primates. The studies reported deal with such topics as the blood groups and the pattern of immunoglobins in chimpanzees and other non-human primates. Though the data are of interest as a contribution to comparative biochemistry and immunology, this work has not yet developed to the stage where the direct relevance to the human situation is apparent, and is therefore of limited medical interest.

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Cell Differentiation. A CIBA Foundation Symposium. Edited by A. V. S. de Reuck and Julie Knight. (Pp. 257; illustrated + tables.) London: J. & A. Churchill. 1967.

This volume is a record of one of the small international symposia organized by the Ciba Foundation in London. Perhaps the clearest summing up of this