In a study of twenty-nine families showing tooth deficiency, Barbara Burks found evidence of linkage with hair colour. D. J. Finney also obtained statistical evidence of linkage between allergy and the *ABO* blood groups; while Munro, Penrose and Taylor, from analysis of twenty-five sibships, found an indication of linkage between the blood groups and phenylketonuria.

As regards disorders, R. C. Robb reported on 100,000 hospital patients, and D. P. Murphy on 935 malformed children studied in relation to birth order, sibs, maternal age, reproductive rate, etc. H. Madissoon cited cases of absence of kidneys (in the foetus) conditioned by heredity. D. Ferriman found that oxycephaly and acrocephalosyndactyly are dominant conditions, probably allelomorphic, and that a third allele may be acholuric jaundice. Race, Taylor and Vaughan showed that a latent

form of the latter disease can be demonstrated by investigation of the blood. Dr. I. Lundholm showed that hypochromic anaemia, which is common in women in Sweden, is conditioned by a dominant gene which prevents the normal absorption of iron through the digestive tract.

J. B. S. Haldane pointed out that natural selection in man may act through survival, sexual selection or reproductive selection (fertility), and that in theory four types of selective process can be distinguished, involving slow or rapid selection of genes, selection of heterozygotes or elimination of rare mutants.

P. J. Waardenburg showed that the *X*-chromosomal eye defects, dystrophia retinae pigmentosa and extraocular nystagmus can be inherited as dominant or recessive sex-linked or dominant or recessive autosomal characters.

GENETICS IN RELATION TO EVOLUTION AND SYSTEMATICS

BY DR. W. B. TURRILL

THE Organizing Committee of the Congress, at the suggestion of the Association for the Study of Systematics in Relation to General Biology, arranged for a special section to be concerned with the wider aspects of genetical research. In spite of the numerous difficulties caused by the international situation both in arranging and carrying out the programme, the results not only justified the attempt but showed the desirability of making a general rule to include in specialist biological congresses a section devoted to overlaps of the special subject with other branches of biology.

The programme of the section was so arranged that papers were grouped under the following general titles: Hybridization, Comparative Genetics and Evolution, Micro-evolution, Experimental and Wild Populations, and Polyploidy and Reproductive Mechanisms. In the plenary session of the section, Th. Dobzhansky dealt with the genetic structure of natural populations. He urged that "according to the genetic theory the pressure of the evolutionary factors, such as mutation, selection, isolation, and migration is constant and unrelenting. A living species can hardly remain

static for any length of time. It is a task of the investigator to observe evolutionary changes not only *post factum* but also in *statu nascendi*, in nature as well as under laboratory conditions". There is a hidden field of variation, detectable not through observations on the phenotype but only by genetic and cytological means, and this must engage the attention of students of evolutionary mechanisms. The main part of his paper dealt with *Drosophila pseudo-obscura*, and it was shown that this is a dynamic species of local colonies which can pursue, within certain limits, independent evolutionary courses. Only secondarily through migration and selection of superior genotypes formed in such colonies can the texture of the species as a whole become gradually altered.

G. Tischler, under the (translated) title the "Role of Chromosomal Race Differences in Systematics and Plant Geography", stated that at least 400 wild cœnospecies of Angiosperms are known which contain races with chromosomal differences. Many species become capable of surviving in a climatically unfavourable environment through polyploidy, but within these species many type plants have

remained diploid. Numerous species have become weeds with a world-wide distribution, but their diploid races have only a local significance. Allopolyploids may inhabit wider areas than either parent. Polyploids may develop a perennial habit, apomixis, or seasonal dimorphism.

J. S. Huxley, in a general paper on "Systematics in Relation to Genetics", gave a valuable summary of the tendencies of modern taxonomy, illustrated by many examples. He showed that the progress of taxonomy itself, and its contacts with other branches of biology, are converting it into the basis of the study of evolution in action. In the first place, cytogenetic analysis is shedding light on particular taxonomic problems; secondly, taxonomic advance is suggesting important questions for experimental analysis; and thirdly, a combination of all lines of approach is increasing both the scope and the precision of the general principles underlying taxonomy and making it possible to forecast the course of differentiation and evolution in different kinds of taxonomic groups. It is not only cytology and classical genetics which are needed to co-operate with taxonomy, but also ecology and embryology are equally essential.

W. B. Turrill considered "Taxonomy and Cytogenetics in Plants" and pleaded for close co-operation between taxonomists and cytogeneticists. He illustrated the most desirable lines for such co-operation by examples of problems of mutual interest under the following headings: classifications of characters, degree of correlation of characters, constitution of taxonomic groups, the study of polymorphic groups, geographical and ecological problems, hybridization in Nature and experiment, problems of apomixis, problems of phylogeny, and general suggestions.

S. C. Harland read a paper under the title "Genetical Studies in the Genus *Gossypium* and their relation to Evolutionary and Taxonomic Problems". Within the widespread species of this genus in both the Old and New Worlds he traced the consequences of isolation for several millions of years. Species crossing and the study of their cytology in *Gossypium* has led to the accurate delimitation of the genus, has shown that species may be regarded as systems of modifiers, has revealed the taxonomic position of species in relation to other species, and has proved that species intercrossing results in the disintegration of the co-ordinated modifier systems possessed by each; it has shown that geographical isolation causes profound genic change, has indicated that genes may become mutable when transferred to the genetical background of other species, and has suggested that the number of alleles at a given locus differing only slightly in their reaction with the genetical background is probably large.

It is impossible in this article to deal with contributions to the ordinary meetings of the section except in a very brief and most generalized manner. The recognition of much more hybridization in the wild amongst animals than has usually been admitted by zoologists was stressed in several papers. The importance of population studies in throwing light upon the actual mechanism in evolution was also emphasized. The geographical distribution of 'races' in both animals and plants is obviously receiving increased attention and proving a connexion 'between genes and geography'. The wide occurrence of polyploidy and apomixis in plants is being shown to be one of the causes which make it difficult to accept the species as a clear-cut taxonomic unit.

GENETICAL ASPECTS OF GROWTH, NORMAL AND ABNORMAL

BY DR. A. HADDOW

THE fundamentals of this subject were outlined in a paper by E. B. Ford, who demonstrated how growth may be determined genetically by the most diverse means. Thus it may be under the control of a single factor-pair, or very numerous

genes, approximately equal in effect, may co-operate. Again, while the genetic situation can influence cell-size or cell-division directly, the effect on growth is frequently indirect. For example, genes controlling the endocrine glands