between laboratories, and variations in scoring procedures as being problems needing attention.

In general the volume is a well-produced and useful review of the present state of knowledge in this complex field. The editors, organizers, and publishers are to be congratulated on the production of such a useful volume at a reasonable price, with a relatively short time lapse between the conference and the publication of the papers.

JOHN L. HAMERTON

The Chromosome. Structural and Functional Aspects. A Symposium, Miami, 1965. Organized by Dr. George Yerganian. (Publication of the Tissue Culture Association. Vol. 1. Annual Symposium June 1-4, 1965). (Pp. xiii + 107; illustrated. 68s.) Edinburgh: E. & S. Livingstone. 1965.

This book contains the original papers contributed by chromosome cytologists and biochemists at a symposium held in Miami, June 1965. The topics range from the cytogenetic mechanisms and evolution of mammals, techniques for the automated analysis of the morphology of metaphase chromosomes, the molecular structure of chromosomes from evidence derived from electron microscopy, the action of viruses and specific antimetabolites, estimates of the metabolic turnover of nuclear proteins, to mechanisms of derepression and repression of RNA transcription and their relation to the structure of hetero and euchromatin.

R. Mathey uses chromosome diversity within and between populations of the African pygmy mouse to demonstrate the ways in which chromosome changes of the Robertsonian type and differences in the sex chromosome mechanism can result in isolation barriers and hence give the possibility for sympatric speciation. He examines these mechanisms in the sympatric species *Mus minutoides minutoides* and *Mus minutoides indutus*, and finds that the species represent the terminal homozygotes of an 18/36 Robertsonian system and have different sex chromosome mechanisms. *M.m. indutus* ($2n = 36$) has a normal XY sex chromosome complement and *M.m. minutoides* ($2n = 18$) a presumptive X/autosome - Y/autosome translocation sex chromosome complement. A fact which emerges from this most interesting study is that the morphological criteria for distinguishing the two taxa are confined to molar characters and this together with the cytological situation suggests that these mice are probably still passing through a stage of active speciation.

G. Rudkin and F. Ruddle *et al.* present papers on the measurement of metaphase mammalian chromosomes to assess mass and length using automated photometric and photographic techniques, respectively. Rudkin outlines the limitations in measuring small objects of the order of 2 to 10μ using a light microscope and correctly points out that photometric measurements of whole chromosomes are not as susceptible to errors introduced by the resolving power of the optical system used as are length measurements. Ruddle *et al.* go to great lengths to show that their Fidac system of scanning film nega-

tives of metaphase plates is nearly as accurate as manual analysis of bromide prints made from the same negative. This may be so, but it seems to this reviewer more probable that direct photometric techniques, which do not involve intermediate photographic stages and their associated inaccuracies, will in time be more profitable for the automated analysis of chromosomes.

Papers by N. Swift, M. Cohen *et al.*, and T. Hsu *et al.* are concerned with elucidating the molecular structure of chromosomes from different experimental approaches. Swift summarizes the arguments for the one-stranded and multistranded concepts of chromosome structure and principally supports the single strand hypothesis. He suggests that a model of the chromosome in which a series of lateral loops are placed along an axial strand would fit the majority of experimental evidence including the electron microscopic data taken from polytene and lampbrush chromosomes. Cohen *et al.* review literature on the apparent localization of chromosome breakage by viruses and antimetabolites and emphasize the importance of standardized procedures while experimenting in this field. They list the precautions taken to ensure objectivity during experiments in their own laboratory, a list which experimentalists in any field could profitably read. Hsu *et al.* investigate the effect of actinomycin D on chromosomes and conclude that the reagent preferentially attacks the chromatin at sites of RNA transcription.

D. Prescott *et al.* give the results of their investigation on the rate of turnover of tritiated amino acids in proteins, and conclude that there is a complete turnover of chromosomal protein within three cycles.

The excellent paper by J. Frenster on repression and derepression of RNA transcription is sufficient justification in itself for acquiring this book. Frenster succinctly reviews the relevant literature and describes the results of some of his own experiments in which he uses isolated nuclei from calf thymus lymphocytes. Heterochromatin and euchromatin fractions are separated from the nuclei and subjected to chemical and physical analyses. The effects of polyanions, enzymes, and RNA on the rate of RNA transcription in the two types of chromatin are described and discussed. The paper is a significant contribution in a part of chromosome biochemistry which has hitherto appeared confusing to many people. It successfully draws together evidence from many different sources and presents it and the conclusions in a most readable manner.

P. L. PEARSON

Protein Biosynthesis and Problems of Heredity, Development, and Ageing. By Zhores A. Medvedev. Translated from the Russian by Ann Synge. (Pp. xxi + 584; 68 figures + 18 tables. 110s.) Edinburgh and London: Oliver and Boyd. 1966.

All organisms take amino acids and combine them in highly specific sequences to form proteins. The study of the imposition of order by an organism on its environment is what biology is about, and protein