clearly a similarity in the relative occurrence of mongolism in Japan with that in Europe. The incidence cannot be less than 1 in 1000 live births; the risk increases with maternal age only and no effect of birth order or interval between pregnancies could be found. Forssman and Åkesson could find no support for the hypothesis that the operation of recessive genes may be sometimes responsible for Down's syndrome.

The dermatoglyphic analysis by Penrose is presented as a possible means of distinguishing between two similar syndromes, one as a result of trisomy-21 and the other trisomy-22. The evidence was unable to support or reject the hypothesis that two similar syndromes might be recognized as one, viz. mongolism, but it led to an intriguing discussion on the possibility of tetrasomy in man. The DNA replication patterns in the 21/22 group of mosaic mongols, as shown by Fraccaro *et al.*, are well presented. They demonstrate also the dangers of interpretation from such autoradiographic investigations. This contribution aroused discussion on the fate of cell lines in mosaic individuals.

The findings of Mellman *et al.* indicate that there may be a significant shortening of the circulating half-life of granulocytes in mongols. This, in turn, may be the cause for an increase in enzyme activity. An hypothesis that environmental factors, rather than genetic, might be the cause of such granulocyte disturbance is put forward. Finally, there is a very worth-while general discussion (in which appeared the only misprint I detected—the evening primrose, p. 92, is *Oenothera lamarckiana*). This is a most readable book containing valuable data.

S. WALKER

Progress in Biophysics and Molecular Biology, Vol. 16. Edited by J. A. V. Butler and H. E. Huxley. (Pp. 276; illustrated + tables. 84s.) Oxford: Pergamon Press. 1966.

For the past 15 years the annual appearance of a new volume of *Progress in Biophysics*, in its various guises and under its various editors, has been a significant scientific event. The present editors are to be congratulated on having produced a volume which at least maintains, and may even excel, the already high standard of this series. They, and the contributors, are to be complimented not only on the choice of subject matter, but also on the remarkably high standard of lucid writing maintained almost throughout this book. For example, it is well recognized that immunology is one of the most difficult subjects to explain to someone who is not himself involved in this branch of science, partly because of the self-contradictory nature of many of the terms used, and partly because of the intricacies of the subject. Yet N. A. Mitchison's essay on 'Recognition of Antigen by Cells' makes fascinating reading and many workers will want to refer to it. Similarly with the equally complex problems of interest to readers of this Journal, of molecular genetics and of genetic transcription. Each is dealt with authoritatively but clearly in two large articles, one by Sibatani on 'Genetic Transcription or DNA-dependant

RNA Synthesis' and the other by Silver on 'Molecular Genetics of Bacteria and Bacteriophages'. The former will be welcomed by many who want to understand the experimental basis of DNA-RNA hybrid helixes, of the effect of primer-DNA, of ribosomal, of messenger, and of transfer RNA. In the latter, Silver discusses the processes of transformation, transduction, and conjugation in bacteria and bacteriophage, and then has a thoughtful and valuable section on molecular problems of genetics, including a discussion of double-stranded and single-stranded DNA and of the structure of the gene, of mutagenesis, and of the possible molecular mechanisms underlying genetic recombination. Various models are considered in illuminating detail. This thoughtful essay deserves to be read and to be retained for reference by all geneticists. The short article by Sherbet on 'Cybernetic Interactions in Epigenetics' is disappointing in that it seems mainly to be trying to restate, in terminology which is in current vogue, some of the intricate problems of nucleo-cytoplasmic interactions which must occur during embryological development.

Even workers in other fields of study will be glad to have the excellent reviews of Ambrose on the electrophoretic behaviour of cells, of Finean on the molecular organization of cell membranes, and of Caro on autoradiography by electron microscopy. Each author is outstanding in his own subject. The last chapter to be considered is that by Smith on the organization and function of the sarcoplasmic reticulum and T-system of muscle cells. This, too, is a valuable review; the micro-anatomy is of a high standard, but there is always in biology the suspicion that anatomists and function go ill together. This is seen, in Smith's chapter, by his ignoring all the literature on living, functioning, potentially 'striated' muscle cells in which striated fibrils were shown not to be required for contraction.

The only minor criticism of this valuable book is that the index is too inadequate to be functional.

JOSEPH CHAYEN

Antibodies to Biologically Active Molecules. Proceedings of the 2nd Meeting of the Federation of European Biochemical Societies, Vienna, 21-24 April, 1967. Vol. 1. Edited by Bernhard Cınader. (Pp. viii + 424; illustrated + tables.) London: Pergamon Press. 1967.

Immunology is yielding one of the most refined methods for the examination of proteins and, therefore, has become of special interest to the geneticist, particularly as much of it concerns molecular biology. Hence readers of this journal will be interested in these Proceedings of the Federation of European Biochemical Societies. Immunology has progressed from investigating the interaction of toxins and antitoxins to the more searching inquiry as to how an antibody interferes with the biological activity of an antigen at the molecular level. At present such investigations are mostly concerned with the study of enzyme, antibody, and substrate. More

recent advances have been dealing with the interaction of antibody with hormones and viruses, and still more recently it has been demonstrated that RNA and DNA themselves can be considered antigens, and one can expect that certain of the antigenic groups are specific sequences of bases in the double helix. As one of the contributors points out, if this finding is confirmed, this will be a vital and valuable key for the study of the genetic code and for its mode of transcription. In addition to reports on the results of antigenic studies, this symposium also brings many details on technique, for example, modern methods of protein chemistry which allow the investigation of the antigenic sites of proteins.

H. LEHMANN

Aspects of Medical Virology. Edited by A. P. Waterson. *British Medical Bulletin*, Volume 23; No. 2. (Pp. 5; 30s.) London: The Medical Department, The British Council. 1967.

The great success of genetic analysis for the bacterial viruses (phages) now spurs on the animal virologists. In a recent issue of the *British Medical Bulletin* devoted to medical virology, Dr. P. D. Cooper outlines the methods of genetic analysis available in the study of animal viruses—recombination, complementation, and physiological functions—but concludes that good genetic markers are still lacking. 'Temperature-sensitivity' is, as yet, the only demonstrably universal marker for animal viruses and has been used in the study of polio, polyoma, and two arboviruses—Sindbis and Semliki Forest. The other universal marker for phage is 'suppressor-sensitivity'; but attempts to find analogous animal virus systems have not, so far, been wholly successful, though they have been tried for rabbit pox and herpes virus strains. The author concludes that 'information from genetic analysis should greatly expand during the next five years'.

R. J. C. HARRIS

Die Evolution der Organismen. Band I. Ergebnisse und Probleme der Abstammungslehre, 3rd ed. Edited by Gerhard Heberer. (Pp. xvi + 754; 265 figures + 8 tables. DM.128.) Stuttgart: Gustav Fischer Verlag. 1967.

This is the first volume of the third edition of a three-volume handbook which ranges over the whole of evolution. The second and third volumes are due to be issued in 1968 so that the whole edition is appearing one hundred years after Haeckel's 'Generelle Morphologie der Organismen' (1866) and his 'Naturliche Schöpfungsgeschichte' (1868); consequently this volume is in his memory and carries his portrait opposite the title page. It is likely that the subsequent volumes will be of more interest to readers of this journal, for the second will deal with evolutionary genetics and the third with the phylogeny of the hominadae. However, this volume will be prized by anyone who is interested in the evolution of animals and plants.

The first section deals with general principles and considerations. Although the standard of all the articles is high, two deserve especial praise for clarity and detail. The first of these is by Simon and Zippolt on geological dating, stratigraphy, the use of pollen, and the use of radioactivity for dating strata. The second is by Kuhn-Schnyder on palaeontology. Both articles have excellent charts and drawings which relate the different fossils to the different geological levels and indicate probable lines of evolution. This section also includes a philosophical discussion, at some length, by Zimmermann on the methods of evolutionary science; he ranges from early mythology and Aristotle through to Goethe and so to modern times, but barely mentions Lamarck. The article by Wickler on behaviour is fascinating, though at a lighter level.

The second section deals with the evolution of organisms in detail. Kaplan discusses the earliest living forms, the definition of life, and after a brief mention of bacteria, blue-green algae, and PPLO, he launches into the molecular basis of the living process. The usual subjects are reviewed: DNA replication and reproduction; genetic information and protein synthesis; viruses; how you can make organic molecules from gases. Admittedly this is the current fashion but the present reviewer cannot help feeling that none of these processes has much meaning unless they occur inside a living cell and that such articles miss the whole point of 'the living process' which is the maintenance of biological organization. The other two articles in this section, that by Mägdefrau on the evolution of plants and that by Remane on the evolution of animals, are highly commendable. They deal concisely with what is known about each main group of living organisms.

The book is extremely well illustrated by photographs and drawings; there are good charts and diagrams to help the reader through the millions of years which are so well reviewed.

J. CHAYEN

The UFAW Handbook on the Care and Management of Laboratory Animals, 3rd ed. Edited by the Staff of UFAW. (Pp. xvi + 1015; illustrated. 120s.) London and Edinburgh: E. & S. Livingstone. 1967.

Those familiar with the first and second editions (1947 and 1957) need no recommendation for the third edition of this excellent handbook. It skilfully rejects what can be omitted (though still useful) to make room for material that must be included as a result of what Sir Peter Medawar calls, in his foreword, the three revolutions. These concern genetics, husbandry, and the control of disease. The first-named revolution allows control of the hereditary variation in the experimental animal; the second (which includes among many things the statement of the Animal Technician as a member of a profession ancillary to biological and medical science) allows control of the external environmental variation; and the third, which enables specification of animals in