

# Book Reviews

**Knight, C.A.: Molecular Virology. 1. Ed.**

New York: McGraw-Hill Book Company 1974. 235 pp., 54 figs., 33 tabs. Soft bound

The basic principles of virology are discussed with reference to the virus as a particle and infectious unit. Its nature as an antigen and viral diseases are not discussed. After delineation of the historical background and after a short presentation on the different methods of purifying viruses, some results on the studies of purified virus are described: Its structure, morphology, chemical composition, and the functional significance of the nucleic acids and virus proteins. In the following sections, the complex interactions of viruses with cellular constituents is explained by discussing the invasion of a cell by a foreign genetic system and the subsequent consequences to its health. In this connection, the simultaneous infection with unrelated viruses, the process recombination, the recombination of nucleic acids in mixed infections (heritable changes), phenotypic mixing, the role of helper-virus and the phenomenon of interference are all referred to. The mutation of viruses, their molecular mechanisms and the chemical correlation between viral genes and their protein products are described thoroughly. The concluding chapter discusses the origin of viruses, their possible reconstitution and synthesis, the proviruses, virogenes and viroids. This book is a necessary work, easy to comprehend, and well documented. It is suitable for advanced high school students as well as for graduate students in a variety of disciplines.

H. Röhrer, Rathenow

**Timofeeff-Ressovsky, N.W., Jablovskov, A.N., Glotov, N.V.: Grundriß der Populationslehre. Genetik. Beitrag 8.**

Jena: VEB. Fischer 1977. 272 pp., 89 figs., 5 tabs. Soft bound DM 45,-

The study of populations is a very complex field, and has, therefore, been divided for a long time into more limited, specialized fields of investigation such as population dynamics, population genetics, and the behaviour of populations. Scientists active in any one of these component disciplines need to have a general knowledge of what is going on in all the other areas of population science. The goal of this book is to provide such an up-to-date picture of the field as a whole, as well as to function as a textbook for students of the subject.

The book contains five chapters. The first provides an introduction to the subject, explaining fundamental concepts and giving definitions of important technical terms and parameters. The second deals with the various characteristics of populations, including the biological properties of spaces, geographic distribution and isolating mechanisms, types and intensity of reproduction, etc. In Chapters 3 and 4, the genetics of populations and the phenotypic properties of populations are covered, whilst the last chapter concentrates on population evaluation. Throughout the book, the examples used to explain particular problems are well chosen. The illustrations are of high quality and the bibliography, consisting of about a thousand references, is comprehensive.

Of course in any one book of modest length it is impossible to give a comprehensive coverage of every aspect of this enormous theme. But the authors have been successful in producing an overview of population science which is both instructive and interesting. Professor dr. Hans Stubbe, who is responsible for having the book translated into the German language, has done a worthwhile job.

H. Skjervold, Vollebakk

**Davidson, R.L.; de la Cruz, F. (Eds.): Somatic Cell Hybridization A Monograph of the National Institute of Child Health and Human Development.**

New York: Raven Press 1974. 295 pp., 52 figs., 54 tabs. Hard bound \$ 30.00

In the sixties, several laboratories succeeded in inducing the fusion of somatic mammalian cells and subsequent culturing of their hybrids. The technology has since expanded tremendously and now has several applications in cell biology, genetics, developmental biology, virology, tumor biology, immunology, and agriculture. Cells of such diverse origin as plant and human species can now also be fused.

R.L. Davidson and Felix de la Cruz in the book 'Somatic Cell Hybridization', edited the proceedings of a conference held in 1973. The book focuses on four main subjects in which somatic cell hybridization proves to be a valuable tool:

1. Chromosome segregation and gene linkage: Somatic cell hybridization has greatly contributed to the mapping of the human genome. The results are reviewed by F.H. Ruddle. Seven short papers deal with different aspects of gene mapping, the fate of mitochondrial DNA in hybrids, and chromosome elimination.

2. Viruses, cell membranes, and malignancy: H. Koprowski's and Barbara Knowles' review covers the broad area of viruses, immune functions, and antigenic determinants in hybrids. This section contains papers on such a problematic question as the expression of malignancy in hybrid cells.

3. Regulation of gene expression: This is the most extended chapter of the book and contains the review of R.L. Davidson on the expression of differentiated functions in hybrids, followed by 15 short papers.

4. Gene expression in heterokaryons: N. Ringertz, who was among the first to study this problem, summarizes the available information about heterokaryons with respect to the regulation of nucleic acid synthesis and phenotypic expression.

Though the book is far from giving the complete spectrum of the applications of somatic cell hybridization, nevertheless it may serve even now as an introduction to students and scientists working on other topics.

I. Raskó, Szeged

**Leucaena.** Promising forage and tree crop for the tropics. Report of a study jointly conducted by the Philippine Council for Agriculture and Resources Research and the US National Academy of Sciences.

Washington: Nat. Acad. Sci., 1977. VII, 115 pp., 52 figs. Soft bound

A new crop plant for tropical and subtropical regions, the versatile legume *Leucaena leucocophala* is presented in this report. Although used by aborigines for 2000 years on marginal lands in Central-America, this plant has only recently attracted the attention of the NAS and the Philippines Council for Agriculture and Resources Research. Its native habitat is Mexico, where researchers have located already more than 100 varieties. This report of the joint panel meeting summarizes a detailed description of the plant: Its soil needs, requirements for reforestation and its potential and actual use as animal feed and fuel wood. It becomes clear that *Leucaena* will become one of the new crop plants for varietal introduction, hybridization, selection and seed production technology. It seems worthwhile to draw *Leucaena* to the attention of applied geneticists.

H.F. Linskens, Nijmegen

**Dhom, G. (Ed.): Verhandlungen der Deutschen Gesellschaft für Pathologie, 60. Tagung, gehalten in Freiburg vom 8. bis 12. Juni 1976.**

Stuttgart-New York: Fischer 1976. 545 pp., 214 figs., 25 tabs. Soft bound DM 198,—

The main topic of the 'Verhandlungen...' is the Lysosomes and their significance in pathology. These heterogeneous cytoplasmatic particles are characterized by containing hydrolytic enzymes. In the reports covering the main topic, the following are of interest for research workers in human-genetics: The genetic heterogeneity of the Lysosomal storage diseases (Gitzelmann et al.), the deficiency of sphingomyelinase in Niemann-Pick disease (Schaefer et al., Wegmann et al.), the biochemical findings in Mucopolipidosis II (Gathmann et al.) and the report on Sanfillipo's disease type A (Cain et al.).

H.-A. Freye, Halle/Saale

**Sutcliffe, J.F.; Pate, J.S. (Eds.): The Physiology of the Garden Pea. Experimental Botany: An International Series of Monographs, Vol. 12.**

London-New York-San Francisco: Academic Press 1977. XVI, 500 pp., 137 figs., 25 tabs. Hard bound \$ 36.10

There are many advantages in using the garden pea for studying physiological problems. A wide range of genetic variants, including several thousands of mutants, are available and all these genotypes are homozygous because of the cleistogamy of the species *Pisum sativum*. A large number of genetically uniform seedlings can easily be prepared for experimental purposes. They are very vigorous and respond rapidly to various physiological and biochemical treatments. Furthermore, organ and callus culture is possible. Thus, the garden pea is, in many excellent ways, suitable for physiological analyses representing a model plant in dicots.

This becomes evident in the book 'The Physiology of the Garden Pea'. It contains 16 chapters written by different authors in which the various disciplines of plant physiology, including the genetic situation of the pea and its utilization in plant breeding, are discussed. The earliest stages of ontogenetic development are dealt with in a detailed manner by considering the biochemical processes during germination: The metabolism of proteins and nucleic acids, the activity of specific enzymes, the role of microorganisms and storage substances as well as the influence of seed age and storage. In later developmental stages, various physiological, morphogenetic and histogenetic problems of the root and shoot system are discussed with reference to the structure and ultrastructure of the meristems and details of the cell cycles. The role of gibberellins, auxins, abscisins, and cytokinins during shoot and root development and flower formation is intensively reviewed. Other chapters of the book deal with the response of the pea plants to various light conditions, problems of photosynthesis and translocation, fruit and seed development as well as storage substances of the seeds. In this connection, the genetic control of flower formation and seed protein production is reported. The specific physiological situation of the pea as a leguminous plant with regard to its nitrogen metabolism is intensively discussed with consideration to the formation and physiology of root nodules as well as the relations between symbiosis and environment. The

broad range of subjects is introduced with a historical survey on the use of *Pisum* in physiological research.

The chapters of the book contain many figures and are supplemented by detailed lists of references. In this way, a very substantial survey of the physiological behaviour of the garden pea is given which can be widely generalized if the reader wishes. Because of the actuality of the problems discussed, the book is not only of interest for physiologists of the various special disciplines but also for geneticists, plant breeders, phytopathologists, and biochemists.

W. Gottschalk, Bonn

**Ts'o, Paul O.P. (Ed.): The Molecular Biology of the Mammalian Genetic Apparatus. Vol. 2.**

Amsterdam-New York: North-Holland Publishing Company 1977. XX/326 pp., 107 figs., 41 tabs. Hard bound \$ 46.75

The contributions contained in this second volume of the International Symposium on the Molecular Biology of the Mammalian Genetic Apparatus are the natural sequence of the topics discussed in the first volume which dealt chiefly with the organization of DNA and chromosomes. What makes this volume so interesting is that it gives an overall view not only of the latest results in the field of the functional organization of the eukaryote genome (rightly not restricted to the mammalian genetic apparatus as one would expect from the title) but, and more important, of the logic of the strategies employed. It seems fair to say that, even considering the enormous complexity of the problem, the technical tools nowadays available are powerful enough to make one feel confident of their adequacy in reaching the goal. Hence, success will depend firstly on how imaginatively the techniques will be employed; and secondly, on how astutely the organisms and the materials for each question to be asked will be chosen. Although it is certainly true, as J. Kendrew wrote a few years ago (*The Thread of Life*, 1966), that 'it makes sense to think about a generalized cell independently of the organism from which it has derived', it is equally true that subtle, and sometimes even important, differences have arisen in the course of evolution among even very closely related species. These differences, if judiciously exploited by the imaginative investigator, may become a powerful tool to throw light on a number of problems and may in fact substantially contribute to the construction of the picture of the 'generalized cell'. Several reports in the book indeed show how important the complementarity of information that can be obtained by asking the same question of different organisms is.

The focus of the contributions of this volume is on the regulatory mechanisms of the genetic apparatus of the eukaryotes in relation to differentiation, cancer and aging. It is probably my own bias, but I like to think of cancer and aging as the price paid by the organisms for differentiation; the underlying regulatory mechanisms should hence be the same.

One criticism I have of the book is that there is only one article dealing with the immune system. I find this rather surprising as immunology is not only one of the most powerful tools to study the problems of genomic functions and hence of the specificity and properties of the various cell lines, but also because the formation of the immune system has been one of the greatest steps in the evolutionary history of the organisms.

A. Monroy, Naples