

Book Reviews

Götze, D. (Ed.): The Major Histocompatibility System in Man and Animals. 1. Ed.
Berlin-Heidelberg New York: Springer 1977, 404 pp., 23 figs.
Hard bound DM 67,60

This book is a summary of the available data on the Major Histocompatibility System (MHS) for all of the species in which detailed analysis has been attempted. After an introduction by D. Götze, the MHS of the following species are described: MHS in man (E.D. Albert and D. Götze), MHS of subhuman primate species (H. Balner), of the dog (H.M. Vriesendorp, H. Grosse-Wilde and M.E. Dorf), of cattle, pig, rabbit and Syrian hamster (P. Ivanyi, W.R. Duncam, J.W. Streilein), of the guinea pig (A.F. Geczy and A.L. de Weck), of the rat (E. Günther and O. Stark), of the mouse (C.S. David), of the chicken (K. Hala), and MHS and Minor Histocompatibility Systems of ectothermic vertebrates (N. Cohen and N.H. Collins). The last chapter deals with the evolution and function of the MHS: Facts and speculations (J. Klein). Each chapter gives information on the genetics, physiology, biochemistry, and biology of the MHS. The comprehensive data are presented in a concise, closely reasoned and readable form. The book is nicely written and the tables, figures and diagrams are clear. 'The Major Histocompatibility System in Man and Animals' is of great value for clinicians interested in neoplastic, autoimmune, and infectious diseases, as well as in transplantation. Embryologists, population geneticists, virologists and others in the fields of MHS will find this a valuable reference. F. Herrmann, Erfurt

Origins of Lymphocyte Diversity. Cold Spring Harbor Symposia on Quantitative Biology. Vol. XLI: 1. Ed.
New York: Cold Spring Harbor Laboratory 1977. 1024 pp., 410 figs., 365 tabs. Hard bound 2-book set \$ 60,—

The topic of the first Cold Spring Harbor Symposium on immunology in 1967 was the diversity of antibodies; the second symposium in 1976 dealt with 'the origins of lymphocyte diversity'. In the Symposium Volume XLI, ninety six papers are published, dealing with lymphocyte function (328 p), the major histocompatibility complex (303 p) and immunoglobulins (263 p). The well-balanced choice of contributors ensured an extensive coverage.

In Part I of the Symposium Volume, the functions of lymphocytes are described in 34 papers covering T-cell markers and differentiation, the helper and suppressor T-cells and their products, the B-cell differentiation, and commitment and the receptors. The genes and products of the major histocompatibility complex (MHC) were the second major theme of the Cold Spring Harbor Symposium in 1976. The MHC is a genetic region that encodes the major barrier to transplantation in man and in all other species studied so far. It was first identified through mouse breeding studies which subsequently led to the identification of the H-2 region. There are at least 15 loci which determine the ability of mice to exchange grafts. HL-A is the human homologue of the H-2 region and, correspondingly, the strongest of the transplantation barriers in man. The genetic regions HL-A, HL-B and HL-C are located on the sixth human chromosome; the five major subregions in the mouse, on chromosome 17. The papers of this section deal with chemical and immunological characterization of the products of the MHC of man, mouse and guinea pig. The genetics of the MHC and associated products are discussed in eight papers

(polymorphism, genetic control, selective expression). Seven papers cover the role of histocompatibility gene products in T-cell cytotoxicity. In subsequent articles, details of the genetic control of T-B cell interactions and of the antigen presentation are discussed. The last major theme is devoted to immunoglobulins. In the Symposium Volume, 26 papers are published concerning the structure and diversity of immunoglobulins, the allotypes and idiotypes, as well as the biological and structural aspects of generations of diversity. The Symposium Volume contains a name index as well as a subject index.

This Volume of Cold Spring Harbor Symposia on Quantitative Biology represents a collection of 96 original papers on antibody diversity within the much broader field of lymphocyte diversity. The authors describe new methods and techniques in detail and report results which are very important for the understanding of cellular processes which are a part of so many lymphocyte classes. Thus, Volume XLI presents our present knowledge of this field, distanced only by a ten-month publication lag from the Symposium. Immunologists, cell biologists, membrane biochemists and geneticists interested in immunology will find this volume most valuable. It should be in the library of every department of immunology, physiology, biochemistry, biology and genetics.

M. Herrmann, Erfurt

Bresch, C.: Zwischenstufe Leben. Evolution ohne Ziel. 1. Ed.
München-Zürich: R. Piper 1977. 316 pp., numerous figs. in two colours. Hard bound DM 32,—

This is another attempt to participate in the marketing of molecular biology which began with Monod's 'Le Hasard et la Nécessité' in 1970, and was continued by such competent writers as François Jacob ('La Logique du Vivant' 1970), Peter B. Medawar ('The Act of Creation 1972') and Manfred Eigen-Ruthild Winkler ('Das Spiel' 1975). Once again science, from astrophysics to brain research, and human society are mixed together in a so called science book for the educated layman, but in fact, a potpourri of non-fiction facts and a lot of fiction called general principles, roots of ultimate questions and distant aims. This book offers itself as an answer to the general orientation crisis of modern man. Written with verve and a good feeling for popular science writing, it is, in fact, a brilliant and popular introduction to exobiology, molecular biology and some aspects of ethology. The author begins by saying he will not acknowledge any authors later than Charles Darwin; a few pages later he is already citing Eigen, Monod and Luria. The intention is 'to obtain help from science to regain the meaning of our existence, ostensibly lost by science'. So the author tries to show that evolution is a continuous growth process of patterns in the universe. However, he declines the so-called old-elitairic concepts with the man as the top of the evolution, as well as the so-called new-elitairic concept of the solidarity of the human being in an ice-cold, taciturn universe: neither a Teilhard de Chardin nor a Monod.

The epilogue, which is decorated by a citation of Hermann Hesse, mentions Alpha and Omega. So his solution is that 'man needs more love towards mankind'. And what about evolution? 'Readiness to integration is the Urkraft for all development'. It seems, that Goethe looks around the corner and the good, old entelechia ... It is hard for the best-selling author of an excellent genetics textbook to go into philosophy.

H.F. Linskens, Nijmegen

Nagel, W.: Zellkern und Zellzyklen. Molekularbiologie, Organisation und Entwicklungsphysiologie der Desoxyribonucleinsäure und des Chromatins. Stuttgart: E. Ulmer 1976. 486 pp., 122 fig., 35 tabs. Cloth DM 120,-

The special value of the book is based on its inclusion of many important methods related to theoretical facts. The relationship between obtaining data and the methods used to obtain is a necessary one to know since progress in science today implies, to a high degree, effective methodology.

The contents of the book are subdivided into chapters about molecular organization (DNA, repetitive DNA, satellite DNA, repetitive genes, chromatin, and nuclear proteins), structural organization (visible in the light microscope, ultrastructure), functional organization (transcription, functional units of the chromosome, nucleo-cytoplasmic relations), DNA-replication and normal and changed cell cycles.

The author tried to give the reader as much new information as possible. He refers to good reviews, monographs and papers (literature 78 pages each of them with about 50 references!). This kind of performance provides extensive information, although in some areas the reader will have to study the cited literature to get a survey. Along with many very sound chapters there are some pages dealing with DNA replication, which are not quite so good: Contrary to the author's opinion, DNA replication proceeds in both directions in Okazaki-fragments (p. 224); the role of polymerase I is not clearly described; B-chromosomes also have an adaptive value (p. 159).

E. Günther, Greifswald

Reimer, L., Pfefferkorn, G.: Raster-Elektronenmikroskopie. 2. Ed. Berlin-Heidelberg-New York: Springer 1977. XI, 282 pp., 146 figs. Soft bound \$ 34,40

The increasing use of the scanning electron microscope (SEM) in different fields of science has led to new developments and improvements of many techniques during the last few years. Users of the SEM will therefore welcome the second edition of the book on 'Rasterelektronenmikroskopie' by L. Reimer and G. Pfefferkorn, both experts in this field. The introduction contains three tables provided with references to the corresponding §§ and figures in the text, which give instructive surveys of (a.) the different manners of operation, the physical effects they are based on, the information that can be expected and the order of resolution; (b.) the methods of interpretation of electronical signals and the occurring changes of signals and their use; and (c.) the different methods of evaluation of scanning electron micrographs and the information one can expect to obtain from them. The following seven chapters are: 'Reciprocal effect electron - matter' (40 pp.); 'Electron optics, construction and function of the SEM' (46 pp.); 'Image with secondary-, backscattering electrons and probe currents' (55 pp.); 'Scanning-transmission-electron microscopy' (16 pp.); 'Elementary analysis and images with emitted quantum and auger electrons' (33 pp.); 'Methods of evaluation of scanning electron micrographs' (13 pp.) and 'Preparation' (34 pp.). Each chapter is well referenced. For both scientists and technicians with a background in physics, this book provides an excellent basis for understanding the practical use of scanning-electronmicroscopic methods. The biologist will be interested particularly in the last, well illustrated chapter on 'Preparation' which contains important information on how to obtain optimal results with water containing biological material. Different methods are presented from which the investigator can make his choice dependent upon the nature of his material and the equipment at his disposal.

A.W. Dicke and M. Kroh, Nijmegen

Oberdisse, K. (Ed.): Diabetes mellitus B. Handbuch der inneren Medizin, Bd. 7: Stoffwechselkrankheiten, T. 2 B. 5. Ed. Berlin-Heidelberg-New York: Springer 1977. XXVII/1254 pp., 222 figs. partly in color. Bound DM 490,-

Diabetes mellitus is an illness which has to be considered in all the subspecialties of internal medicine. It was therefore necessary to ask 32 authors for detailed descriptions of such seemingly diverse problems as obesity, hyperlipoproteinemia, vascular and renal diseases, ophthalmology, and liver, gut and skin disorders. Of great importance to the clinician are the chapters on therapy, divided into units on coma diabeticum, hypoglycemia, dietetics and pharmacological treatment by insulin, tolbutamide, sulfonylurea and their derivatives. When reading the generally well written text, one gets the impression that the authors wrote from a point of view of practical knowledge and with good theoretical and experimental bases.

The large number of clear figures illustrating the text enriches the didactic value of this book. The index of about 50 pages, including key-words for both parts (A and B) and the literature to each chapter, summarizing nearly all publications up to 1976, gives this volume the typical and expected format of a hand-book useful for all physicians, biochemists and researchers in other disciplines working on diabetes mellitus.

There is no information for people with special interest in genetic problems. This topic had been published in vol. VII/2 A by G. Jörgensen. In the described volume (VII/2 B), only small remarks on the genetic factors of diabetes mellitus are made in some chapters. No more information is given than that there is no doubt with respect to the heredity of this illness.

W. Jorde, Mönchen-Gladbach

Dudits, D.; Farkas, G.L.; Maliga, P. (Eds.): Cell Genetics in Higher Plants. Proceedings of an international training course. 1. Ed. Budapest: Akadémiai Kiadó 1976. 251 pp., 58 figs., 19 tabs. Hard bound DM 37,50

In July, 1976, a symposium on 'Cell Genetics in Higher Plants' took place in Szeged, Hungary. This was followed by a laboratory course for 25 'students' from 16 countries. The present book, which appeared only a few months after the course (for which the editors are to be congratulated), consists of 16 of the lectures given during the meeting and outlines of the 5 laboratory topics. Due to the speed of its publication, a few mistakes and technical deficiencies must be tolerated. The major part of the book is comprised of outstanding articles, which include a number of unpublished results and methods by leading scientists in plant tissue culture and genetics which review the different aspects of the field. The microtechnique for the large-scale screening for culture conditions of single cell suspensions (Potrykus et al., otherwise unpublished methods) is one such example. Some of the contributions are very short; applied aspects such as the combination of somatic and conventional genetics for plant breeding, as well as the field of haploid induction are unsatisfactorily covered. Regrettable also is the brevity of Redei's (et al.) article on genetic studies of DNA-corrected mutants of Arabidopsis and Kao's unillustrated contribution on cytological studies on plant heterokaryocytes. Both talks were among the highlights of the conference in Szeged. The topics of the laboratory course included pollen- and protoplast-culture, protoplast-fusion and -modification, and seemed to me to be only useful to the immediate participants of the training course.

The mechanical quality of the edition should be improved since, after only normal use of the three copies available to the reviewer, the copies disintegrated.

F. Hoffmann, Ladenburg

Gunther, F.A.; Davies Gunther, J. (Eds.): Residue Reviews. Residues of Pesticides and Other Contaminants in the Total Environment, Vol. 67. 1. Ed.

Berlin-Heidelberg-New York: Springer 1977. X / 139 pp., 30 figs., 23 tabs. Hard bound DM 38,20

Vol. 67 of Residue Reviews is dedicated to the topic 'The Citrus Re-entry Problem: Research on its causes and effects, and approaches to its minimization.' The current problem is the use of cholinesterase-inhibiting organophosphorus pesticides, but in the future, concern will likely extend to other compounds and other biological effects, such as conjunctivitis and dermatitis. The following aspects are presented in detail: Physiological effects of organophosphorus pesticides on workers, how workers become exposed to residues, dimensions of the re-entry problem, legislative approaches to the re-entry problem, measurement of pesticide exposure and the California citrus investigations. Such investigations in California have included topics on foliar dislodgeable residues – methodology; the effect of soil dust type, climatic factors, application methods, formulation, and citrus variety, on residue dissipation; the reduction of residues by tree washing and by chemical degradation. Fruit rind residues, orchard soil dust residues, airborne residues, in the vapor phase and as particulate residues are discussed. Methods other than human exposure studies for assessing hazards in treated groves are also reviewed: Foliar residue and soil residue estimation, mathematical estimation methods, and odourants as pesticide residue warning indicators.

W. Dedek, Leipzig

Köhlein, F.: Freilandsukkulanten. 1. Ed.

Stuttgart: E. Ulmer 1977. 284 pp., 105 figs. Hard bound DM 78,—

In this edition, the famous writer of interesting books on gardening and expert on many specialities of this topic, Fritz Köhlein, introduces winter-hardy succulents. The book is about the genera *Sempervivum*, *Jovibarba*, *Sedum*, *Rhodiola*, several cacti, and some rare succulents. In general, these genera do not play an important role in horticulture. Fritz Köhlein, however, as a particular devotee of plants, again shifts rarities into the focal point of interest and stimulates botanists to occupy themselves with these jewels from the arid zones and the steppe. In reviewing these plant genera, the author was supported and advised by specialists from several European countries. Thus the result is a high level book, not a monograph in the strict botanical sense, but an ambitious book on gardening for connoisseurs and fans.

In the first part, a general introduction into the different possibilities of using succulents is given. The span reaches from the placing of pottery to the designing of large-scale stone and dry gardens. Technical details are explained by instructive drawings.

In the main part of the book, the different genera are explained in detail. The author ventures to straighten out the big muddle in the genus *Sempervivum* by presenting three proposals for a systematic classification. In a long list incorrect designations of *Sempervivum* are rectified. The given descriptions of the species are related to morphological characters and to the mentioning of requirements applying to the locality. After the description of genera and species, special propagation methods, measures of plant protection, and peculiarities one has to know for cultivating plants properly are mentioned. This is especially valid for winter-hardy succulents. For the designer of gardens, the chapters on the possibilities to combine succulents with other arid-loving plants are of particular value. Excellent colour pictures display something of the beauty of the plants described in this book. Without hesitation, this work can be recommended to all plant-lovers as well as to the experts.

H. Fromme, Gatersleben

Harrison, G.A.: Population Structure and Human Variation. International Biological Programme 11. 1. Ed.

London-New York-Melbourne: Cambridge University Press 1977. 342 pp., 43 figs., 47 tabs. Hard bound £ 17.50

This book is a collection of reports based on the plans and results of studies on human populations. It is a contribution to the International Biological Programme, Section Human Welfare, established by the International Council of Scientific Unions in 1964. Although the various articles are rather different with respect to their specific problems, the general topic, how man can adapt ecologically to environment, is significantly apparent. Since all of the studies were planned on a broad basis, they generally refer to genetic as well as phenotypic adaptations, together with demographic and medical data of the specific populations, tribes or ethnic groups. Each contribution can be considered as a review and all of them are written in an easy understandable way. With respect to authorship, the volume demonstrates real international cooperation. The first chapter by Mourant, dealing with genetic markers of blood in man, is a general survey of this topic. Subsequent chapters, however, are about special studies on populations and their demographic characteristics in relation to ecological adaptations to extreme environments. Rychkov and Sheremetyeva present data on human isolates in North Asia; four other papers (by Neel, Layrisse and Salzano; Hiernaux; Cavalli-Sforza; Horna-brook), on the other hand, describe the genetic and physical composition of human populations adapted to the tropics; other climatic situations, present on the Salomon Islands (studied by Page, Friedlaender and Moellering), and in the semi-arid zones of Africa (studied by Huizinga), are also discussed. The effect is a differentiation process between the populations which is reflected in their genetic, cultural and medical compositions. In contrary to investigations on old and well-adapted populations, the study of recent migration offers another approach to the adaptation problem. Three different chapters deal with it: One with migrants from the Tokelau Islands to New Zealand (Prior et al.); another with the Jewish remigration to Israel (Edholm and Samueloff); the third with the effect of urbanization in South Africa (Vorster).

The collection of these eleven studies can certainly not be considered as a text-book of human biology but will be of importance to all those who are teachers or research workers in all fields of anthropology, human population genetics, human ecology or human biology. There is no question about its scientific value but some general doubt may remain whether a collection of eleven elected papers can ever cover the vast field of human population biology or even can be useful for somebody who is not familiar with the subject.

D. Sperlich, Tübingen

Gebhart, E.: Chemische Mutagenese. 1. Ed.

Stuttgart-New York: G. Fischer 1977. 195 pp., 42 figs., 40 tabs. Soft bound DM 38,—

The detection of chemical mutagens in both natural and man-made environments by use of various mutagenicity test systems has reached a stage where it seems profitable to summarize the results obtained and to give a survey for those people which are not directly engaged in genetic toxicology research. This has been done successfully by Erich Gebhart in the present booklet. All problems involved in the detection, verification, quantification, and extrapolation to man are presented logically and didactically. Starting with a short summary of the molecular aspects of chemical mutagenesis, the main chapters of this booklet deal with test procedures, standard mutagens of different classes (here are included such important questions as comutagenesis, antimutagenesis, dose-response, time-dependent activity, DNA repair, muta-

genesis-carcinogenesis, and mutagenesis-teratogenesis), mutagens from man-made sources (special reference has been attributed to industrial mutagens, pesticides, food additives, various drugs, artificial sweeteners, heavy metals, and addictions), as well as practical and legislative aspects of mutagenicity testing. Various groups of chemical mutagens have been summarized in informative tables which allow a quick and realistic survey of test results obtained in different systems ranging from bacteria up to mammalian germinal cells. The present book gives a good insight into problems of mutagenicity testing and provides fundamental information not only for the geneticist, but also for people which are interested in the mutagenic activity of environmental chemicals, the results obtained, and their use for protectional activities.

R. Braun, Gatersleben

de Nettancourt, D.: Incompatibility in Angiosperms. Monographs in Theoretical and Applied Genetics, Vol. 3, 1. Ed. Berlin-Heidelberg-New York: Springer 1977. 230 pp., 15 figs. Hard bound DM 56,—

Congratulations to Dr. de Nettancourt and the Editor for an excellent book on Incompatibility in Angiosperms. This subject is an intriguing one for several reasons. Plants have evolved the most varied and efficient outbreeding methods to suit their special sedentary requirements; we know much about the genetics, and the *S* gene still holds the record for the largest allelic series, but little more than hypotheses get to the real biochemical core of the problem. Self incompatibility is a recognition system of great specificity and similar in complexity to the histo-incompatibility systems in mammals. In the plant it rejects self; in the animal it rejects non-self. The similarity is particularly useful now that 3 and 4 complementary gene systems have been found in the two major systems, gametophytic and sporophytic. The origin of new allelic specificities is still not clear despite the suggestive work of the author. The evolutionary aspects and population studies of incompatibility have in the past concerned all of the triad of the founding fathers of population genetics, Fisher, Haldane and Sewall Wright. From the practical point of view incompatibility has been used in producing F_1 hybrid vegetables, and by mutation in the creation of self-compatible fruit trees.

All these aspects, and others, supported by some 600 references are reviewed and synthesized into a clear, albeit complex, picture. The style of the book is clear, discursive and non-didactic but with clear conclusions where these can be drawn.

Reading the book was a pleasure but reviewing it dispassionately has not been easy because the author has treated the reviewer's work and thoughts so generously that it would seem churlish to point out the inevitable small deficiencies of fact and occasional misrepresentation which arise in any book of this scope, but

the four that have been noticed in a first reading will be given in the hope that further editions will appear and that these points are not merely the reviewer's prejudices.

1. An unintentional confusion can arise by placing together (p. 22) the 2 gene system of grasses with the duplicate gene system in certain *Solanaceae*. The distinction, which the author fully realises, is that the grasses have a functional complementary I system and the *Solanaceous* plant has a functionally duplicative I system. Although both systems might have arisen as a gene duplication, the distinction is of great importance particularly in view of the recently discovered 4 gene system in *Ranunculaceae*, *Beta vulgaris* and *Eruca sativa* which are all complementary I systems and have great significance in the evolution of the I system in plants.

2. A point of less importance in the inclusion of the *Amaryllidaceae* in families which have trimorphic incompatibility, although *Narcissus triandrus* has three lengths of style and different anther heights, the incompatibility is not related to the trimorphy; it is spuriously trimorphic. The importance of this is that the three families *Pontederiaceae*, *Oxalidaceae* and *Lythraceae* which have developed true trimorphic incompatibility have two distinct whorls of anthers, epispalous and epipetalous, indicating that the differentiation of gene action in the two sets of anthers in the same flower has only been possible where two developmentally distinct whorls of anthers exist. The *Amaryllidaceae* then becomes the pseudo-example which proves the rule because this family does not have two separate whorls of anthers.

3. The statement on the effect of temperature (P. 106) groups all temperature effects as 'leading to breakdown of self-incompatibility'. The first temperature effect was found in *Oenothera*, *Prunus*, *Primula* and *Petunia* which showed that a high temperature, but still within the normal physiological range, actually enhanced the incompatibility reaction so that pollen tubes were inhibited in a shorter time and after less growth than at lower temperatures. This was important not only to show that the inhibitory reaction had a Q_{10} , but provided an experiment which showed, at least in *Oenothera* that the inhibition is irreversible. These are facts which must be considered when discussing — as on Page 87 — the possible nature of the inhibition.

4. The last point is one of omission. There is no mention of the *S* origin of the balanced lethal system in ring forming *Oenothera* species. This was outlined independently by the reviewer and Dr. Crowe and by Dr. Steiner. The evidence is that the ringforming system has its first start with either a self-compatible *S* mutation or a duplication with heteroallelic *S* competition. This puts a new evolutionary importance on the *S* gene and throws new light on the evolution of the balanced lethal system.

I hope that it is clear that these minor points are evidence that I consider the book to be a great contribution to our knowledge of plants and their wonderful breeding systems. D. Lewis, London