Book Reviews

Levitzki, A.: Quantitative Aspects of Allosteric Mechanisms. Molecular Biology, Biochemistry and Biophysics, Vol. 28.
Berlin-Heidelberg-New York: Springer 1978. VIII, 106 pp., 13 figs., 2 tabs. Hard bound DM 39,60

During the last two decades it has become clear that allosteric regulations in enzyme and other protein systems causing positive or negative cooperative ligand binding play an important role in all living cells.

The aim of this monograph, the author says in his preface, is 'to summarize the essential features which characterize the behaviour of regulatory systems' and 'to provide the reader with the quantitative tools to analyze any specific regulatory system'. Indeed both aims are reached in this clearly-written book. It begins with two introductory chapters on the basic concepts of allosteric control and the structure of multisubunit proteins. Then, in chapters 3 and 4, the thermodynamic approach of cooperative ligand binding is given. Much attention has been paid to the Hill-plot and the Hill-coefficient as an index for cooperativity. Chapter 5 treats in detail the molecular models of Monod, Wyman and Changeux (concerted model) and Koshland, Némethy and Filmer (sequential model), comparing them with each other and with the thermodynamic approach. By starting in both cases with the simplest multisubunit protein, the dimer, the basic ideas of the two models are first clearly explained and then the theory is extended to the general case.

In the last chapter (6), some attention is given to cooperativity caused by ligand coupled association or dissociation of the protein, and to negative cooperativity. Here we missed the remark that a Hill-coefficient of less than 1.0 does not necessarily point to negative cooperativity. For example, two classes of independent sites with different intrinsic affinities also give a Hill-parameter of less than 1.0.

On a whole it is a most valuable book for all who are interested in interactions between ligands and macromolecules.

G.A.J. van Os, Nijmegen

Siegel, B.P., Bessei, W., Grauvogel, A.: Verhaltensmerkmale bei der Züchtung von Geflügel.
Stuttgart: E. Ulmer 1978. 60 pp., 16 figs., Hard bound, DM 12,–

This collection of four contributions to the topic of behavior in poultry is a timely effort in focusing attention on an increasingly important area of interest to scientists, poultry producers and the public at large.

In a survey of his research program at the Department of Poultry Science, Virginia Polytechnic Institute, Professor Siegel reviews longterm selection experiments in the mating frequency of quail and chickens. Selection response over more than ten generations demonstrates dramatically the genetic control of mating behaviors and enables the author to draw conclusions about genetically correlated characteristics. Furthermore, there is ample evidence of genotype-environment interactions when birds differing in mating behavior are observed in diverse situations. Another area of active study by Siegel concerns the measurement of fear in flocks with diverse selection histories, such as those mentioned above.

A second contribution by Dr. Siegel focuses on his interest in the genetic control of social stress in chickens. Two lines of chickens selected for high and low plasma corticosterone levels, respectively, are investigated under diverse social environments, such as crowding, and important practical conclusions appear to emerge from these studies. Exposure of these birds to disease as well as social stresses demonstrates important interrelations of social factors with the environment and genetic potential.

Dr. Bessei's contribution emphasizes the need for observational techniques which permit objective measurements of behavioral parameters. Automated data collection is of special concern to the author, whose interest focuses on such topics as feeding activity, of birds in groups. His presentation contains valuable suggestions in this respect.

Finally a survey of animal behavior research at Hohenheim is given by Dr. Grauvogel, who also emphasizes the need for a better understanding of an animal's state of well-being.

Taken together the four papers give the reader an up-to-date, if incomplete review of research in social behavior of poultry. In view of current efforts in many countries to legislate management controls for poultry this publication gives a sobering impression as to how much more needs to be learned in order to approach such as task with objectivity.

The papers are well illustrated but contain a number of typing errors.

H. Abplanalp, Davis

Weber, E.: Mathematische Grundlagen der Genetik. Genetik, Ergebnisse und Probleme in Einzeldarstellungen. Beitrag 5, 2. Ed.
Jena: G. Fischer 1978. 515 pp., 96 figs., 94 tabs. Soft bound DM 90,–

The first edition of this book was published in 1967. In this 1978 second edition additional material has been included: e.g. several now classical tests and a detailed discussion of the Hardy-Weinberg law. Its contents include: random events, relative frequencies, probability, conditional probability, random variables, probability distributions, in particular Bernoulli, Poisson, Gauss; testing of hypotheses, sample distributions, χ^2, t– and F distributions, testing of distributions, testing for independence; estimation of parameters, Maximum Likelihood, estimation of several parameters, confidence intervals; variance analysis, regression analysis, correlation analysis, method of path coefficients. These first ten chapters (280 pages of 515) contain a review of the major fields of statistics which have been designed for the non-mathematician and illustrated by many substantial examples from genetics.

Chapter 11 ff. are devoted to models in genetics and population genetics: random mating, Hardy-Weinberg law, sex-linked locus, two loci, convergence to equilibrium, phenotype/genotype action of a gene, additive effects and dominance, genetic variance, genetic relations between relatives, identity by descent, inbreeding coefficients, heritability, non-random mating and inbreeding in populations with random mating. Selection (the various cases of Fisher's model), selection index, mutation against selection and subdivided populations are also discussed. Although the latter section is headed 'migration', spatially distributed populations are not covered. The appendix contains matrix algebra, stochastic matrices, linear recursions and mathematical tables (distributions and tests).

This book has several advantages: it is a description of statistical methods in genetics as well as mathematical models in genetics, both are mathematical fields important for geneticists; it can be understood without too much mathematics, and is nevertheless mathematically correct. Numerous detailed examples are carried through to numerical results and enclosed tables facilitate applications.

K.P. Hadeler, Tübingen

Edwards, J.H.: Human Genetics, Outline Studies in Biology.
London: Chapman and Hall 1978. 80 pp., 29 figs., 7 tabs. Soft bound £ 1.75
This eighty page booklet contains 10 chapters which go from classic genetics: (1) 'the units of inheritance', (2) 'the chromosomes', a.s.o. to (10) 'some further topics'. This latter chapter contains 22 items in an complete alphabetical order (e.g. 'a paragraph on dermoid' between one on 'cousin mariage' and one on 'genetic engineering'). The book is evidently written by a physician who invokes medical students to study the heredity of diseases. As a basic introduction to the mechanism of heredity it is inadequate. The overall impression is that there is much enthausiasm but a lack of acuity. Many passages are interesting and even critical but too long to be understandable. The paragraph on recessive disorders (4.2) gives no clue to the interpretation of a pedigree. Unconventional notations (p. 9 on purines and pyrimidines; p. 67 on pedigree notation) will be confusing (even to the author on p. 9). Some statements are misleading, e.g. 'the chromosomes are the genes' (p. 19). Some tables (e.g. 7.1) and figures (e.g. 9.2) are not understandable. Although ch. 8 deals with artifical selection no definition of selection is given in the text nor in the glossary and it is not inserted in the index. Judged from this outline human genetics is a very simple science. S.J. Geerts, Nijmegen

Hiatt, H.H., Watson, J.D., Winsten, J.A. (eds.): Origins of human cancer. Vol. 4: Cold Spring Harbor Conferences on Cell Proliferation.
New York: Cold Spring Harbor Laboratory 1977. 1960 pp. Hard bound $ 45,–
The 'Origins of Human Cancer' is based on a Cold Spring Harbor Conference on Cell Proliferation held in September 1976. The program was very full, and more papers (119) were presented than in any meeting ever held at Cold Spring Harbor. Altogether the three volumes have a total of 1889 pages. Book A deals with Incidence of Cancer in Humans (Sections 1-8: Effects of Geography and Genetic Background, Changing Patterns, Effects of Occupation, Industrial and Agricultural Chemicals, Air and Water Pollutants, Effects of Drugs, Effects of Radiation, Effects of Diet). Book B is continous with Mechanisms of Carcinogenesis (Sections 9-14: Electrophilicity, Modifying Factors, Aryl Hydroxylase Genetics, Damage to DNA and its Repair, DNA Viruses, RNA Viruses). Book C contains papers on Human Risk Assessment (Sections 15-19: Animal Cancer Tests, Short-term Assays – Predictive Value, Possible Dietary Carcinogens, Public Policy Panels, Further Strategies and Standard Setting).

Written by experts (such as Bruce Ames, John Cairns, Joyce McCann, Irving Selikoff, George Todaro), each section reviews current literature and presents new material acquired during experimental and clinical observation.

The books have an excellent author and subject index. At the end of each article the literature is listed. The volumes are well produced and the tables, diagrams and photographs are clear. The price has been kept within reach of most people and the value for the money is excellent.

These three volumes contain our present knowledge of such an important subject as the origins of human cancer. They will unquestionably have a wide circulation among clinical and animal oncologists, molecular biologists, biochemists, geneticists, virologists, immunologists, toxicologists and scientists from industry. No scientific library will be complete until it contains the 'Origins of Human Cancer'. M.Ch. Herrmann, Erfurt

Krüssmann, G.: Handbuch der Laubgehölze. Bd. III: Gattungen PRU-Z. 2. Ed.
Berlin-Hamburg: P. Parey 1978 VIII, 496 pp., 844 figs. Hard bound DM 228,–
Volume III is the last of the descriptive works of this handbook; the index-volume should follow in a short time. This third volume includes all the genera from *Prunus* L. – *Rosaceae* to *Ziziphus* Mill. – *Rhamnaceae* according to the alphabetical order of the scientific names of the genera, species and infraspecific taxa.

The enlargement of this part in comparison with the first edition (1962) is very extensive; it comprises 146 pages with 55 new genera. Newcomers are, e.g. *Pseudowintera, Psidium, Roystonea, Sapium, Thevetia, Trema, Wikstroemia.*

Illustrations are very important for a handbook about broadleafed trees. It is remarkable that the number of figures (339) is increased nearly twofold relative to the first edition. In addition, we find an increased number of tables (152) and 16 colortables for the first time. The illustrations in general, not only the line etchings but also the photographs, are of good quality and closely correspond with the text.

Some views are of a high practical value: cultivars and their relations to relevant species, e.g. in the genera *Prunus, Pyracantha, Tilia, Viburnum.* The user will also find some new keys, e.g. for the forms of *Prunus laurocerasus* and for the species of *Pyracantha, Wisteria.* But this very welcome enrichment should in future be better employed for the larger genera. In this manner this excellent work will be further improved.

The outstanding contents of this well known standard work must be emphasized. W. Vent, Berlin

Announcement

The Fourth John Innes Symposium 'The Plant Genome' and The second International Haploid Conference

will take place on 10–14 September, 1979 at John Innes Institute, Norwich, England.
Subjects will include: Chromosome Organisation, Genetic Instabilities, Organelle Genomes, Haploid Production, Achievements Using Haploids.

There will be a workshop on haploidy on 14 September.
The Ninth Bateson Memorial Lecture will be given by Prof. J. Heslop-Harrison, PhD, DSc, FRS, FRSE. Information: Justine Speed, symposium secretary, John Innes Institute, Colney Lane, Norwich NR4 7UH, England.