

## Book Reviews

**Segal, J.: Biophysikalische Aspekte der elementaren Zellfunktionen.**

Leipzig: VEB G. Thieme 1978. 240 pp., 105 figs. 14 tabs. Soft bound DM 39,-

This book is the last volume of a series on biophysical aspects of cell functions written by Prof. Dr. J. Segal. The hypotheses presented in this volume are based on the theories about structure and properties of proteins dealt with in volumes 2 and 3 of this series.

In the first part of the book the writer disputes the generally accepted theories about the nature of membrane potentials and the generation of action potentials in nerve cells by challenging their bases: the free mobility of ions in- and outside the cell. He suggests that the ions in the cell are bound to proteins and that during excitation the pH in the cell decreases, causing the release of ions by changing the structure of proteins (Keto-Enol transients).

The same type of changes in the structure of proteins are assumed to regulate the biochemical processes in the cell. This provides, among other things, the basis for the development of a therapy on cancer practised in Russia.

The last part of the book deals with the intracellular conduction of excitation and the mechanical power of the cell. The hypothesis, based on the principle of sliding filaments for muscle contraction, the movement of cytoplasma, the migration of chromosomes in mitosis and the activity of flagella, is discussed. A hypothesis is presented on the contraction of micro-filaments or microtubules caused by phase changes of the proteins of these cellular structures. The conduction of excitation in the cell is said to be performed by microtubules.

Conclusion: the hypotheses presented in this book are based on the results of biochemical research of the writer in the late fifties and more recent research of many other scientists. They explain experimental results which are not in agreement or are even contradictory to the current theories on these subjects. For this reason this book is of great interest for every scientist working in this field.

A.W. Spanjers, Nijmegen

**Mourant, A.E.; Kopeć, A.C.; Domaniewska-Sobczak, K.: Blood Groups and Diseases. A Study of Associations of Diseases with Blood Groups and other Polymorphisms.**

Oxford: Oxford University Press 1978. 328 pp., 2 figs., 21 tabs. Hard bound £ 25.00

Frequencies of blood groups vary widely between different populations and races are well-known characteristic associations between particular blood groups and specific diseases. The term 'Blood groups' in this book refer not only to the classical blood groups, but also to all other genetic polymorphisms which can be detected by blood tests (variants of the plasma proteins, the haemoglobins, the red-cell enzymes, the histocompatibility antigens). In 250 pages the authors have collected and tabulated data published internationally about the presence or absence of associations between particular polymorphic systems and particular diseases. This highly informative, vast amount of data, treating it statistically, has an important bearing on clinical diagnosis and makes an interesting contribution to human biology. Written for clinicians, anthropologists and geneticists the book is a sequel to the second edition of 'The distribution of the human blood groups' by the same authors.

H.A. Freye, Halle/S

**Dingle, H.: Evolution of Insect Migration and Diapause. Proceedings in Life Sciences.**

Berlin-Heidelberg-New York: Springer 1978. 284 pp., 103 figs. Hard bound DM 50,-

The editor writes: 'This volume is an outgrowth of a symposium entitled "Evolution of escape in space and time" held at the XV International Congress of Entomology in Washington D.C., USA in August, 1976'. It appeared two years later, a delay which seems to be inevitable, but still regrettable, for symposium volumes. In this case expansion and alterations of the original papers justified the delay.

The contributors placed evolution in the spotlight. This led to a few repetitions of generalities, however, the reader is free to read his own personal selection.

The unity around the theme of evolution is possible because of Kennedy, to whom the volume is dedicated, and his general concept. His original concept, that both migration and diapause form a specialised behaviour for escape from spatially or temporally restricted, adverse conditions, becomes fully justified by the papers.

The authors are all active in research and many of them present their newest results, complemented with relevant literature. Each contribution, therefore, contains good, up-to-date information, sometimes with too elaborate reasonings. Altogether, a broad field is made penetrable for those who have some basic knowledge of insects. Practical summaries are missing. Diversity of subjects and of approaches prevents too much overlap. It is certain that the editor (H. Dingle) also deserves credit for this. He arranged the papers in 3 sections: I Migration: hormonal control in Heteroptera (M.A. Rankin) and ecology of locusts, Orthoptera (R.C. Rainey); II Diapause: comparative study of related species, Chrysopidae (M.J. Tauber and C.A. Tauber), crickets, Orthoptera (S. Masaki), or, of several families of insects and mites (M.A. Hoy); study of phenology, in Lepidoptera (G.P. Waldbauer) and diptera (J. Lumme); and the implications for fitness in Diptera (C.A. Istock); III Migration and diapause in relation to the life histories, all applied to Heteroptera (C. Solbreck, K. Vepsäläinen, H. Dingle). T.R.E. Southwood ends with indicating future lines for research.

The layout forms a unity; the numerous subtitles contribute to its readability, and in this way compensate for the photoprint of typewritten pages, with open right-sided margins, which are too narrow for annotations.

The book is worth its price. N.B.M. Brantjes, Groningen

**Kappert, H.: Vier Jahrzehnte miterlebte Genetik.**

Berlin-Hamburg: P. Parey 1978. 184 pp., 6 figs., 13 outlines. Hard bound DM 24,-

There were many good discourses with old colleagues at the XIIIth International Congress of Genetics in Moscow in August 1978, and on one such occasion a Swedish friend asked me whether I would not be willing to write, in continuation of my 'Kurze Geschichte der Genetik bis zur Wiederentdeckung der Vererbungsregeln Gregor Mendels', the history of genetics from 1900 to 1950. At that time the book being reviewed at present had not yet appeared. Hans Kappert, successor of Erwin Baur to the directorship of the Institut für Vererbungsforschung in Berlin-Dahlem and occupier of this position from 1931 up to his official retirement has now presented a brief, critical history of genetics for the period in question. All further discussion regarding this topic can therefore be

dropped. From 1910 onwards Kappert actively participated in the development of genetics: he published and reported a great number of papers and experiments; he carefully and critically followed the ever-growing literature and eventually left the report of his personal experiences in form of a manuscript. We are indebted to Wolfgang Horn and Günter Wricke for having the manuscript revised and completed and thanks are due to the publishing house of Messrs. Paul Parey, Berlin and Hamburg, for the excellent publishing work.

In 1910, as a student of botany, Hans Kappert came to Carl Correns, who at that time was professor of botany at the University of Münster. He graduated with him in 1914 and subsequently he followed his teacher to the Kaiser-Wilhelm-Institut für Biologie in Berlin-Dahlem in the same year as an assistant. Under the influence of Correns Kappert he came to the decision to dedicate himself fully to the science of genetics. The years of need during and after World War I was the period in which his interest was aroused in the application of genetics in plant breeding. In 1920 Kappert went to the research institute of the Verband Deutscher Leinen-Industrieller in Sorau and in 1924 he accepted the position of managing plant breeder with the house of Messrs. Gebrüder Dippe at Quedlinburg, where he dedicated himself to the breeding of vegetables and flowers on a genetical basis. From Quedlinburg he succeeded Erwin Baur in Dahlem. After his official retirement Kappert returned to his native town of Münster where he worked, for a number of years, as a professor of genetics thus continuing his activities as an academic teacher up to the last years of his life. Besides his extensive literary work and his activity as the author of textbooks, the co-editor of 'Handbuch der Pflanzenzüchtung', 'Zeitschrift für Pflanzenzüchtung' and 'Theoretical and Applied Genetics', 'Vier Jahrzehnte miterlebte Genetik' has been published from his life-time accumulated papers.

The work, divided into 5 sections, begins with results and problems of genetics up to 1910 (Chapter 1). It is the first decade after the rediscovery of Mendel's laws of heredity and research work is concentrated on the validity of the laws of heredity, the invariability of the hereditary material, atypical segregation ratios, species hybrids and quantitative characters and areas where the chromosomes are understood to be the bearers of the hereditary substance.

Chapter 2 deals with the decade 1910 to 1920 where problems of sexual inheritance in plants and animals, the Oenothera-problem and the verification of the chromosome theory were at the centre of research work. In this period Kappert reports on his work as Correns's assistant and on that of his colleagues at the Kaiser-Wilhelm-Institut für Biologie.

The second decade of genetics experienced by Kappert, 1920 to 1930, saw essential progress in the fields of theoretical and applied genetics, combination breeding, heterosis, inheritance of quantitative characters and further development of the chromosome theory of heredity. Polyploidy, experimental mutation research and plasmatic inheritance were important stages in the development of theoretical and applied genetics and opened a dynamic epoch of research.

The third decade from 1930 to 1940 (Chap. 4) showed an intensification, deepening and verification of a number of research areas: chromosome theory and gene exchange, experimental induction of gene mutations and chromosome and genome mutations. This led to the discovery of the gene → RNA → protein → phenotype choice relationships and also to new results in plasma genetics, in inbreeding and heterosis and to the intensive dealing of quantitative genetical problems by mathematical methods. It

should be remembered that, at this time, many German geneticists had to emigrate because of persecution by the Nazi regimen. This was a loss that essentially reduced Germany's contribution to the progress of genetics.

The last chapter (5) deals with the progress in genetical research in the years of 1940 to 1950. Work during this period suffered considerably during World War II: by the growing destruction of research places, by military service and by the death of many gifted young research workers. In the Germany after the War, the field of genetics suffered in particular from the recruiting of young geneticists by countries which, for the present, offered them better opportunities for research work. The consequences of World War II made many geneticists direct their attention to the problems of applied genetics, to research work in the fields of plant and animal breeding in order to help improve the food situation. In the field of theoretical genetics the results of experimental mutation research confirmed the significance of mutations in evolution.

The editors have completed the book with biographical notes, a bibliography and a list of all dissertations performed under Kappert's direction.

The book is written with great clearness and presents the author's personal opinions of the many important stages in the development of his special interests from 1910 to 1950. His mathematical talents, his zeal and his great industry made him study a number of different botanical subjects. These were studied in precise experiments and in exact demonstrations followed by reflections upon the practical application of the results obtained. Hans Kappert was also known as an excellent academic teacher: his lectures and exercises were of good quality and were interesting to all listeners. He filled many students with enthusiasm for the science of genetics and renowned geneticists have come from his pupils. His 'Vier Jahrzehnte miterlebte Genetik' is an important contribution to the history of a science which, since his time, has developed more and more into a central discipline of biosciences.

H. Stubbe, Gatersleben

#### Copeland, J.C., Marzluf, G.A.: *Regulatory Biology*.

Ohio State University Press, USA 1977. 358 pp., 90 figs, 8 tabs. Hard bound \$ 20,-

This book contains nine of the papers read at the 'Second Annual Bioscience Colloquium', College of Biological Sciences, Ohio State University, 4-6 september 1975. The topics covered a range from transcription and replication in phage lambda (W. Szybalski) to regulation of protein and RNA synthesis during early animal embryology (T. Humphreys and K.C. Kleene) and included papers on guanosine tetraphosphate control in bacteria (M. Cashel), the lac operon (M.D. Barkley and S. Bourgeois), bacterial chromosome replication (J.C. Copeland), autogenous regulation of gene expression (R.F. Goldberger and R.D. Deeley), gene expression in fungi (G.A. Marzluf), cell cycle studies (E. Zeuthen) and mRNA structure, synthesis and translation in *Dictyostelium* (H. Lodish's group). Abstracts of 12 contributed papers are added. As a whole the book gives some good examples of the great variety of regulatory processes going on in living cells and the different methods used for their analysis, theoretical considerations included. It seems, however, doubtful, whether a term like regulatory biology really defines a special branch of biology, since nearly all cellular activities are in one or the other way related to regulation.

U. Wobus, Gatersleben