

Book Reviews

Dubos, R.J.: The Professor, the Institute, and DNA.
New York: The Rockefeller University Press 1976.
238 pp., 22 figs. \$ 14.50

When the winner of the 1969 Pulitzer Prize writes an integrated biography history of a man and an institute, one expects not only a book worthwhile to read for its literary quality but also an inside look at an extraordinary man and his place of work. This is indeed the case. The author presents an interesting, lively picture of the eminent scientist Oswald Theodor Avery (1877-1955), little known outside the scientific community, but recognized as the senior author of a paper published in 1944 which gave the decisive evidence that DNA is the carrier of genetic information. Two points are emphasized in this biography. First, Avery was not only the DNA biochemist many people believed him to be, but was originally a surgeon, microbiologist and immunologist who originally emphasized humanities and public speaking during his early university years. Secondly, this book shows that an outstanding, successful scientist has to be in an environment where there is not only recognition of his ideas and appreciation of his personal involvement in doing his experiments, but also appreciation of his forceful and enigmatic personality. It is not surprising that this man, an introvert, who liked midnight discussion but disliked travelling and attendance of scientific meetings, imposed a lasting influence on his associates and on the direction of scientific investigations throughout the world. From beside he came to the laboratory and introduced chemistry into medical research. There is an interesting parallel between Avery's scientific evolution and the rise of the Rockefeller Institute, where Avery was associated for 35 years. Both were aware that the scientific basis of medicine at the beginning of this century was extremely weak. So both, the man and the institute, became more and more chemically oriented, moving quickly to the chemical basis of biological specificity. The culmination of Avery's work was the demonstration that hereditary characteristics are transmitted by the macromolecules of DNA. He is therefore a perfect representative of the attitudes which transformed biology and medicine during the first half of the 20th century to exact sciences.

Dubos's monograph is based not only on the detailed study of documents in the archives of what is now the Rockefeller University and in the American Philosophical Society State Library, but also from information and insights from family, friends, and colleagues and from his own long personal relationship with Avery as a colleague. It is a fine homage with many details, but without any embarrassing unverified stories. Instead of unveiling, we get checked facts or interpretations such as in the concluding chapter "As I remember him": "a gentle mannered and tough minded, consecutive personality, creative and original, with an unspoken scientific philosophy, who considered experimental science as a form of art". Avery became interested in DNA through study of the DNA transformation in *Pneumococcus*. Genetic analysis of this phenomenon indicated that the chromosomal material was transferred to the recipient bacteria where the material paired with the homologous region of the recipient chromosome. Genetic linkage between different factors was also recognized in the transforming deoxyribonucleate agents. When

Avery and his associates suggested that DNA and not protein was responsible for the transformation it was not at all a general accepted fact. It needed some years more before it was generally acknowledged, possibly because he did not use the classical jargon of geneticists when discussing hereditary processes in bacteria. In 1944 his now famous paper was ineffective in terms of public relations. He never received the Nobel Prize for which he was nominated in the late 30s in recognition of his immunochemical studies. It appears that he kept good company with other geneticists, who also were not recognized in time for their contribution to a break-through. Dubos' excellent book, which combines expertise in science and sensitivity for the human being together with a fine style of writing, may be a consolation for old and young geneticists who cannot wait for recognition.

H.F. Linskens, Nijmegen

Kuchler, R.J.: Biochemical Methods In Cell Culture And Virology. 1. Ed.
Stroudsburg, Pennsylvania, U.S.A.: Dowden, Hutchinson & Ross 1977. 331 pp., 29 figs., 48 tabs.
Hard bound \$ 38.00

The topic of the book is presented in 3 parts. In the first main-section the procedures in cell culture with the different milieus for maintaining and growing animal cells in vitro are described in extenso. The detailed delineation of the development of the cell populations is given in a manner of microbiological populations. The author shows the different feasibilities of application of the in-vitro-cellsystem to biological, also genetic research, minus the industrial practices for cell cultures in vaccineproduction lines. Praise worthy is the grouping of the commonest cell strains and established cell strains available for study from the American Type Culture Collection. Part II does not go into such details. In this section the different methods of isolation and identification of animal viruses, especially human viruses, together with the processes of the virus growth and the procedures of purification of viruses are placed foremost. The presentation of the methods of the chemical and physical qualities of the DNA, RNA and the protein of the viruses and cultured eucaryotic cells complete main-section III. The up-to-date summary of the latest methods which also emphasizes the theory for the development of each procedure included evidence of the capacity of didacts and the special experiences of the author. Unfortunately, the reproduction of a number of the figures is not quite what one could wish for. For the remainder the format of the work is excellent. For the student focusing in cell biology or virology the book will serve as an useful introduction. In addition, professionals already working in such areas will find that the methodologies can be applied to their own field of interest. H. Röhrer, Rathenow

Markham, R.; Horne, R.W.: Structure-Function Relationships of Proteins. Third John Innes Symposium, 1. Ed.
Amsterdam-New York-Oxford: North-Holland Publishing Company 1976. 204 pp., 73 figs., 20 tabs.
Hard bound \$ 31.95

The proceedings of the third John Innes Symposium on "Structure-Function Relationships of Proteins" held

at Norwich, July 19-22, 1976, appeared after an amazingly short time. The organisers aimed for subjects as topics of the symposium which were closely related to the study of proteins in the different fields of present biological research. There are general reports on the analysis and the possibilities of the preparation of proteins or particles containing proteins: e.g. "Standards and accuracy in amino acid sequence determination"; "The interpretation of image reconstructed from electron micrographs of biological particles"; "Switching in the selfcontrol of self-assembly". Additional papers are included on particular problems concerning protein biochemistry of biology: e.g. "Relationship between structure and function of haemocyanin"; "Structure and composition of elastin and collagen", and papers about the field of virology, of the immunoglobulins, of the cytochromes and of the repressors and histones. The individual reviewpapers are fully appropriate to present the corresponding subjects to graduated students and scientists of universities and research laboratories. This especially true as each paper contains extensive references on the current and latest literature (up to 1976), which introduce the reader into further details.

H. Hanson, Halle/Saale

Reinert, J.; Bajaj, Y.P.S.: Applied and Fundamental Aspects of Plant Cell, Tissue, and Organ Culture. Berlin-Heidelberg-New York: Springer 1977. 802 pp., 181 figs. Bound \$ 83,60

This book is probably the finest comprehensive treatment of the applied and research aspects of plant tissue culture published to date. Unfortunately, in this area in which progress is being made rapidly, some significant recent findings are not presented due to publication deadlines. The co-editors have brought together a wealth of valuable information by having experienced and highly qualified contributing editors writing the 34 sections of the text. The book is particularly impressive in that both the applied and research areas of plant tissue culture are extensively covered. The use of plant tissue culture in propagation, plant breeding, virus indexing, and producing haploid plants - which are now done commercially or employed routinely by plant breeders and others - are presented up to date. Similarly, in the research sections, several authors point out rather candidly that a lot of potential manipulations or modifications of plants by techniques *in vitro* have yet to reach fruition.

There is some duplication of tabulated media compositions, references, and some segments of various chapters; however, this appears to be minimal. The book is too extensive for a critical review in detail of each section. However, some general observations may be mentioned.

As with many new areas of science, the authors have challenged the reader with new terms and duplicates - mericlone, "somatic fertilization", meristemoïds, parasexual versus somatic hybridization, inhomogeneity, and soma cells are used. Perhaps a glossary of terms would have been valuable for readers at all levels of experience. There are some sections that are peripheral to the main theme; conversely, there is not a chapter dealing solely with cell selection systems - an area that has considerable potential for finding single gene mutants desirable in crop improvement.

The text should serve as a key reference for many years to come for a broad range of students, commercial interests and researchers in many disciplines of the plant sciences.

K.C. Sink, E. Lansing

Mayr, E.: Populations, Species, and Evolution (An Abridgement of Animal Species and Evolution). Cambridge (Mass.) and London: The Belknap Press 1976. 453 pp., 51 figs., 31 tabs. Soft bound £ 3.75

Like Animal Species and Evolution this book is one of the most important books about evolution.

The author emphasizes the decisive role of the species for evolution and describes in different chapters the species concepts, morphological species characters, biological properties of species, kinds of species and multiplication of species. The population with their variations and their meaning for the species are displayed in four chapters. Two chapters deal with isolating mechanisms and their breakdown. The second important factor of evolution is the natural selection. In order to show that the phenotype of the whole organism is the target for selection, in the chapter "the unity of the genotype" processes of allele and gene interaction are explained, and the role of balanced accumulation of genes for fitness are discussed. Three chapters are devoted to speciation. The chapters "species and transspecific evolution" and "man as a biological species" finish the book.

The text represents the enthusiasm of the author for this field of science. Clear definitions, a lot of data as well as striking examples permit comprehensive knowledge about species, natural selection, and their role in evolution. Therefore this book is greatly recommended. In the main part general principles of evolution are represented. The recent results of molecular biology are mentioned only by some examples for the explanation of evolutionary processes.

E. Günther, Greifswald

Kranz, A.R. (Ed.): Proceedings of the Second International Symposium on Arabidopsis Research; Frankfurt/Main 1976. Orders to be sent to the editor. Fachbereich Biologie der Universität, Siesmayerstraße 70, D-6000 Frankfurt/Main 1976. XIII, 227 pp. Soft bound US \$ 13.50

These proceedings, which appeared as vol. 13 of the newsletter *Arabidopsis* Information Service, contain the papers given at a meeting of *Arabidopsis* workers, held September 1976 at Frankfurt/Main. This meeting, like the previous one in 1965, was devoted to genetical, ecological and physiological studies with *Arabidopsis thaliana*. The main accent was on genetics, which is not surprising, since the small size and the short generation time of this cruciferous plant render it very suitable for just that kind of research. Following a survey by Rédei of the possibilities for future research with *Arabidopsis* in several branches of genetics, based on what has already been accomplished, 40 research reports are grouped in seven sections.

The Headings are conservation and organization of seed banks, genetical structure of populations, enzyme polymorphisms, regulator mechanisms, genetics of photosynthesis, morphogenesis and cytogenetics, and somatic cell genetics. Together these contributions offer a good insight into the possibilities and achievements of *Arabidopsis* research, although it is to be regretted that some of them are given in the form of abstracts only. In spite of this point of criticism it can be said that this book contains valuable information for those who are already engaged in *Arabidopsis* research and for those who are considering joining the field. W.J. Feenstra, Groningen