

## Book reviews

**Piel, J. (ed.): The Molecules of Life. Readings from Scientific American**, 1st edn. New York: W.H. Freeman 1986. 139 pp., 101 figs. Cloth \$ 21.95, Paper \$ 12.95.

This book is a collection of 11 articles originally published in the October 1985 issue of *Scientific American*. In the foreword the editors present an excellent overview on their aim by successfully combining the ideas of the different articles. In only 129 pages, the most important molecules, structures, communication networks at the molecular level, embryonic development and evolution are dealt with. Every biologist interested in modern biology should read this book.

In the first chapter "The molecules of life" Weinberg describes not only molecular structures but also the most fundamental experiments of DNA restriction and cloning. In addition, he summarizes methods and possibilities in relation to recombinant DNA technology. The three important polymers of life: DNA, RNA and proteins, and their interactions are the subjects of the next three articles. It is shown that life depends on cellular structures: the cell membrane (chapter 5) guarantees the integrity of the cell in addition to allowing the transport of substances into and out of it; the cytoskeleton (chapter 6) affects cell shape, division and movement within the cell. Chapter 7 describes the immune system. The function of multicellular organisms demands the communication between cells (chapter 8). The two major systems of intercellular communication are the hormonal and the neuronal systems. Molecules engaged in communication within a cell are internal signals. The last two chapters discuss embryonic development and evolution.

The book is not only a very interesting source of fundamental knowledge in molecular biology but also presents the methods used to find such excellent results.

E. Günther, Greifswald

**Chadwick, R.F. (ed.): Ethics, Reproduction and Genetic Control**. Croom Helm: London, New York, Sydney 1987. 200 pp. Hardbound £ 25.00.

The collection brought together by Ruth Chadwick, a Laura Ashley Fellow in philosophy at the University College, Cardiff, consists of seven essays. These have previously been published separately by various experts – a lawyer, economist, philosopher, social scientists, and biologists. In the present volume, what is called the "reproductive revolution" receives adequate consideration from the view point of social ethics, secular moral philosophy, and the theological perspective of the General Synode of the Church of England. The "hot" topic of developments in human reproductive technology and the possibilities of genetic engineering are put into the context of legal and ethical problems. The editor discusses these essays, which originate from different disciplines in the field of reproduction – from test tube fertilization to the prospects of designed genetic changes and human gene therapy. In this

reviewer's opinion, the best essays herein concern ethics. One should not, however, read this collection expecting a detailed description of the various technologies although where eugenics and genetic engineering are concerned, the possibilities are explained in some detail. An example of this is the eugenic programme in Singapore. Thus, reproductive control is not only seen in the light of present Western societies.

The central theme of Part I "Having Children" is the question of the extent of the parent's desire to have a child and to have a child of a certain quality. The editor describes various aspects of this question in excellent introductory essays. She stresses that we can not only be concerned with the desires of adults, but must consider the wider social implications and the special problems that the children produced have to expect – what is called the child-centered approach – and the welfare of the future children. Thus, the whole book is an appeal to the reader to think about the effects of laws, marriage, in vitro fertilization, free choice of the sex of one's child, and genetic engineering on the as yet unborn generations. The second part entitled "The Perfect Baby" stresses the moral implications of eugenic breeding, foetal screening, abortion, gamete donation, gene therapy, cloning and in vitro fertilization. In concluding, the author states that the desire to have a child of a certain quality must be exercised within certain limits, and these limits must be related to the consequences faced both by society and by the desired child.

This collection is, therefore, more an appeal for sensibility regarding the effect of our actions on as yet unborn generations than a list of principles and prescriptions. In a certain way, the developments in human engineering will affect the relations between and the attitudes towards men and women and their roles and values in society. This is a volume which presents topics to discuss and think about because they are of both general and particular interest to each human being.

H. F. Linskens, Nijmegen

**Neidhardt, F.C.; Ingraham, J.L.; Low, K.B.; Magasanik, B.; Schaechter, M.; Umberger, H.E. (eds.): Escherichia coli and Salmonella typhimurium. Cellular and Molecular Biology, Vol. 1 and 2**. Washington DC: American Society for Microbiology 1987. CXX/1654 pp., many figs.

At present, *Escherichia coli* and *Salmonella typhimurium* provide our most profound knowledge of cellular and molecular biology among all organisms studied. For example in *E. coli*, approximately one-third of the gene products have been studied biochemically and their genes identified, more than 10% of the genome has been sequenced, and about 80% of the metabolic pathways have been elucidated. It is research on these two organisms and their bacteriophages and plasmids that has led to our current concepts of the molecular mechanisms of transmission of genetic information, as well as the mechanisms of gene regulation.

Two volumes of this book provide up to date information, useful bibliographies and perspectives for the cellular and molecular biology of these organisms. The book comprises 6 parts containing 103 comprehensive reviews: Part I Molecular architecture and assembly of cell parts (consisting of 9 reviews); Part II Metabolism and general physiology (42 reviews); Part III Genome and genetics (22 reviews); Part IV Regulation of gene expression (21 reviews); Part V Growth of cells and cultures (6 reviews); Part VI Ecology, evolution, and population structure (3 reviews). Parts II, III and IV are subdivided into several sections. Part III, for example, consists of 7 sections: Section A The genome; Section B Alternations in the genome; Section C Gene transfer, conjugation; Section D Gene transfer, transduction; Section E Gene transfer, transformation; Section F Genetic measures of chromosome size; Section G Strains and useful strain constructions. Section A includes linkage maps of *E. coli* and *S. typhimurium* and gene-protein index of *E. coli*, while Section B deals with recombination, repair and mutagenesis. Although the reviews are written by 131 authors, they are reasonably coordinated with each other. The book also contains a useful subject index, which makes it easy for the reader to find the information needed.

Therefore, all scientists interested in working on *E. coli*, *S. typhimurium* and other related organisms will find this book an invaluable guidebook for their investigations. Part III and, perhaps lesser extent, Parts II and IV appear to be valuable for those who apply recombinant DNA techniques in *E. coli* for their research in cell genetics and breeding. It is recommended for your laboratory bookshelf.

S. Iida, Zürich

**McMullen, N.: Seeds and World Agricultural Progress. NPA Report No. 227.** 263 pp., 3 figs., 38 tabs. Washington DC: National Planning Association 1987. Soft-bound \$ 25.00.

The National Planning Association, founded during the Great Depression of the 1930s, is a private, non-profit organization which carries out research and policy formulation with the purpose of bringing together the major economic groups – such as business, labor, and agriculture – in order to preserve and strengthen American political and economic democracy. Using the world food balance as a starting point, the present report puts the production and trade of seeds into proper focus. Every chapter is extremely informative as data has been collected from all over the world, but perhaps the

most interesting to breeders are the chapters on the legal and economic issues, on genetic resources and basic plant breeding methods of seed production, and the importance of hybrid corn seed in the European Economic Community.

Once the reader is aware of the strong position of US trade in hybrid corn seed in Europe, the restrictions which were introduced in 1982 by both France and Italy providing an increased protection to seed industries, become understandable. The research time required for the development of new varieties varies between 7.5 years for corn and 18.5 years for cauliflower. In addition, there is a risk that even after the variety can be marketed, it will not be accepted by the farmers: only 25% of the varieties introduced into the market achieve market acceptance. Another important fact is that seed breeding has become largely a multinational business. The structure of the seed industry has changed dramatically with outbacks in public breeding research programs, the expansion and continued success of the private sector, and the breakthroughs in genetic engineering. The challenge of bio-engineering and the need for capital in order to have a realistic chance of competing in this new environment has made the smaller seed breeder give up and merge with a larger company in the hope that the latter can supply research resources (the cost of developing a new variety is estimated as being between 1.5 and 3.0 million US dollars). Successful industrial firms have diversified and entered this new sector which has such as high growth potential. Companies like Royal Dutch/Shell, Sandoz, Cardo, DeKalb/Pfizer, Upjohn, Ciba-Geigy, and Suiker Unie are now associated with the large seed producers of the world. This does not only induce an increased worldwide concern regarding the reduction of genetic diversity and a greater awareness of the value of existing germplasm, but also the worry of a growing dependence of developing countries on industrial ones.

These are only a few of the topics found in this report of the NPA. The author, Mr. McMullen, is a World Bank economist who believes that high yield, adaptable, disease-resistant seed provides a primary means of keeping agricultural costs in check. Barriers to international trade in seed and seed policy in developing countries demonstrate that the network of international agricultural research institutes play a decreasing role. This report is especially recommended to seed breeders. It is clearly and convincingly written.

H.F. Linskens, Nijmegen

## Announcement

**The 3rd World Congress on Sheep and Beef Cattle Breeding** will be held at the Cité des Sciences et de l'Industrie, La Villette, Paris (France) from 19th to 23rd June 1988

The topics to be covered are: meat production in the European Community; farm performance testing; potential of large cattle breeds for beef production; cattle selection for beef production; recent developments and prospects in sheep selection; contributions of physiology and genetics in improve-

ment of reproductive efficiency; genetic variability of host resistance to diseases; infectious diseases as a restriction on the exchange of genetic material.

*Organizing Committee:* P. Mauléon, A. Besselièvre, M. Courrot, A. Faucon, F. Grosclaude, K. Meyn.

*Information from the General Secretary:* R. Ortavant, I.N.R.A., F-37380 Nouzilly, France. Telex: INRATOU 750954 F, Telephone: 47.42.77.00.

## Erratum

Theor Appl Genet (1986) 71:810–814. Q. Zhang and S. Geng: A method of estimating varietal stability for data of long-term trials

On page 812 an error was found in equation (8) and in the sentence following it. The corrected equation and statement are as follows:

$$\begin{aligned} \hat{y}_{ij} &= y_i + \hat{b}_i (\hat{u}_k + \hat{b}_k e_{2j} - y_k) \\ &= \hat{y}_i + \hat{b}_i \hat{b}_k \hat{e}_{2j}, \end{aligned} \quad (8)$$

where  $\hat{y}_i = y_i + \hat{b}_i (\hat{u}_k - y_k)$  and  $\hat{b}_i \hat{b}_k$  is the reparameterized regression coefficient of the  $i^{\text{th}}$  variety on environments of period II.