

Book Reviews

Kampmeijer, P.; Zadoks, J.C.: EPIMUL, a simulator of foci and epidemics in mixtures of resistant and susceptible plants, mosaics and multilines.

Wageningen (the Netherlands): Centre for Agricultural Publishing and Documentation 1977. 50 pp., 14 figs., 2 tabs. Soft bound fl. 10,-

This monograph describes the theoretical basis and operation of a computer program: EPIMUL. The program is a simulator of epidemics in multiline varieties which differ in their genetic basis of resistance to diseases. The diseases considered have spores as etiologic agents. Among the factors modeled in the simulator are: Initiation and rate of dispersal of infectious spores (modified by failure of dispersed spores to reproduce when resistant plants are encountered); varying geometric and population considerations of crop compartmentalization, leaf area and varieties; and time (latent period, infectious period, and total time domain of the simulation).

By such computer simulations, it is possible to study the influence and interactions of time, space, and population mixtures on the propagation of disease through a susceptible crop. The results are displayed as either graphs or maps, depending on the particular aspects of the epidemic process being considered. Typically, disease severity is presented in the context of the temporal or spatial variables being studied. For the large number of possibilities, the monograph should be consulted.

EPIMUL is a highly idealized model of epidemic propagation (i.e., always optional for disease development). Nevertheless, it approximates aspects of real epidemics rather closely. Even if the reader never intends to use such a model or even get involved with computers, study of the monograph is recommended for its disciplined presentation of factors involved in epidemics.

J. Plotnikova, Moscow, and M. Krichevsky, Bethesda

Scott, D.; Bridges, B.A.; Sobels, F.H. (Eds.): Progress in Genetic Toxicology. Developments in Toxicology and Environmental Science. Vol. 2.

North-Holland: Elsevier 1977. 335 pp., 79 figs., 74 tabs. Hard bound \$ 39.25

This book represents the Proceedings of the Second International Conference on Environmental Mutagens which was held in Edinburgh in July, 1977. It is divided into 10 sections and starts with the plenary lectures, followed by sections on 'Genetic Health Protection', 'Critical Appraisal of Methods in Mutagenicity Testing', 'Industrial Experience of Mutagenicity Testing', 'New Methods of Mutagenicity Testing', 'The problem of Thresholds', 'Utilisation and Evaluation of Short Term Tests', 'Interaction of Mutagens with Each Other and Other Agents', 'Metabolic Activation of Mutagens' and 'Studies in Man'. This list of titles is impressive and serves to indicate the importance that research in Environmental Mutagenesis has for the health and well-being of man. Unfortunately, not all these sections are equally represented; two sections have only one paper and the last three sections have two papers each. The plenary lecture by Magee on 'The relationship between mutagenesis, Carcinogenesis and teratogenesis', whilst concentrating on carcinogenesis, presents an excellent review of the current ideas and stresses the relevance of mutagenesis research to public health. In the review of Evans on 'Molecular mechanisms in the induction of chromosome aberrations', I was interested to note some convergence of ideas, as his discussion of recombinational

repair is not unlike our own proposed model for radiation induced aberrations (first presented in public, March 1977; Chadwick and Leenhouts, Int. J. Radiat. Biol. 34 (In Press)). The paper by Neubert on 'Nature and levels of chemical environmental mutagens, industrial exposure, and population at risk', provides an excellent review of what the hazardous materials are and where they are to be found and gives a lot of food for thought. The paper by Brown et al. on 'The application of short-term microbial mutagenicity tests in the identification and development of non-toxic, non-adsorbable food additives' demonstrates the alternative use of short-term screening tests. A confusion of page sequence makes the interesting article by Dean and Senner difficult, but not impossible, to read (read p. 201, 204, 202, 203, 205). The inability of DMN to induce transformation in C3H 10 T $\frac{1}{2}$ clone 8 cells compared with the positive effects in *S. typhimurium* and V 79 cells (paper by Drevon et al.) illustrates the difficulties which can be encountered in short-term testing. Can it be that the hyper-tetraploid nature of the C3H cells is confusing the results? I found the paper (Seiler) on thresholds obscure, as the data in Table 2 can be interpreted to show neither a real nor apparent threshold. There is a good and humorous paper by Clive showing a linear relationship between cancer potential and mutagenic potential in a mammalian cell system. Two papers emphasize the mutagenic hazards of drinking water and eating grilled food; I normally drink Scotch neat, but barbecuing is going to be less fun this year! The only problem I had with this book was that I found my thoughts being switched about between the cancer hazard and the heredity hazard, and I missed a subject index. These small misgivings apart, I feel that the editors and publishers are to be congratulated on having put this valuable collection of papers into print so quickly. I can recommend this book to all scientists working in the fields of molecular and cellular toxicology, mutagenesis, chemical carcinogenesis, genetics, chemical safety testing and health protection. It should also be of interest to the scientific policy makers in Environmental Science, Agriculture, Pharmaceuticals, the Food and Chemical Industries and Public Health, because these are the areas in which the results of Environmental Mutagenesis research are going to have the largest repercussions.

K.H. Chadwick, Wageningen

Beers, R.F.; Bassett E.G. (Eds.): Recombinant Molecules. Impact on Science and Society (Miles International Symposium Series Number 10).

New York: Raven Press 1977. 556 pp., 124 figs., 56 tabs. Hard bound \$ 47.40

This is the report of the tenth Miles International Symposium which was sponsored by the Miles Laboratories and held during the summer, 1976.

Since 1974 recombinant DNA research and its technology has become a problem area of molecular biology which has aroused wide public interest. The technique is, according to Beers introduction, so revolutionary "that there is a tendency to consider it a unique event in history without precedent".

The general consideration of the implications of genetic engineering on society reflects a historical moment in a heated but fruitful discussion. Since more scientific data are now available, the speculations regarding hopes for benefits in gene therapy, crop improvement and microbiological product synthesis and to potential hazards of this method become more real and sobering. This has

already been stated in the introduction and is repeated in the epilogue (1977). Many articles, presented by well-known specialists in the field, contribute important new facts to our current knowledge. They are informative and fascinating due to their originality. Thirty-five papers are arranged in six sections; each is supplemented by the original record of the critic and open discussions: 1. Technological advances, 2. Development of plasmid vectors, 3. Practical and potential developments in plant genetics, 4. Virus vectors, 5. Cloning of eukaryotic DNA and 6. Societal impact-issues and politics.

Some remarks can be made on a few subjectively selected chapters. A good impression of the frustrations and difficulties involved in the creation of a safer *Escherichia coli* K12 strain is given by R. Curtiss III. The strategy and the progress in the improvement of plasmid vectors is discussed by Boyer, Cohen and Helinski. Szybalski and, in particular, N. Murray present many details on the phage λ -vectors, indicating the great importance of the P_L and P_R promoters for high transcription rates. Reviews on progress in fusion of plant protoplasts are given by Cocking and Melchers. Carlson critically analyzes the possibility of crop improvement by genetic engineering. Three articles (Goff and Berg, Fareed and Hamer) present results on hybrids between phage λ and virus SV 40 and point out the limit of heterologous transcription and translation. Experimental results on the cloning of eukaryotic DNA are the topic of papers by Kedes, Wellauer and Morrow. In the last section, Richmond offers facts on the stability of *E. coli* K12 and the transmission of plasmids in the human gut, which are important for risk calculations. The involvement of the NIH in rulemaking and the situation in western Europe with respect to the development of safety guidelines for handling recombinant DNA are discussed by Jacobs and Tooze. The appendix contains the tables of contents from the safety guidelines issued by the NIH and the Draft Environmental Impact Statement.

In summary: The experimental results presented contain a high amount of essential information partially not published elsewhere. This volume excellently reflects the situation in the development of recombinant DNA research, technology and public discussion on its impacts on mankind in summer 1976.

G. Eitner, Gatersleben

Feeney, R.E., Whitaker, J.R.: Food proteins. Improvement through chemical and enzymatic modification. Advances in Chemistry, Series No. 160.

Washington: American Chemical Society 1977. 312 pp., 67 figs., 49 tabs. Hard bound \$ 23,00

The necessity for high quality protein increase, in order to meet the world's growing protein needs, is becoming a deep and penetrating conviction among plant breeders. Improvements will primarily involve the properties of seed proteins, fish protein concentrates and leaf and single cell proteins. Because cereals and legumes have been genetically selected for high yields of proteins, they generally have lower nutritional values. It becomes necessary, therefore, to seek varieties that have both a high yield and a high nutritional value. A second method is the modification of proteins from higher yielding varieties by chemical and enzymatical methods. This was the topic of a symposium sponsored by the Division of Agriculture and Food Chemistry at the First Chemical Congress of the North American Continent, which was held in 1975 at

Mexico City. The proceedings of this meeting bring together the reports of experts on chemical modification of food proteins and amino acids, particularly the modification of lysinoalanine and soy proteins as well as protein derivatives. Enzymatic modification seems to offer special perspectives. For example, the access to yeast proteins can be improved by enzymatic cell wall degradation. Not only the present status of knowledge is reported, but also further possibilities in this area. Joint efforts between the plant breeders and the food technologists seem to be most promising. The book should, therefore, be a basic reading requirement for all plant breeders engaged in protein improvement.

H.F. Linskens, Nijmegen

Brücher, H.: Tropische Nutzpflanzen, Ursprung, Evolution und Domestikation.

Berlin-Heidelberg-New York: Springer 1977. 529 pp., 245 figs. Hard bound \$ 109,20

The author is an experienced plant breeder who has already earned special recognition for his work with potatoes, beans and Lupinus. Each page of this book demonstrates the knowledge of this geneticist, who upon seeing the problems of tropical agriculture, finds many ways of tackling them. His monograph is more than a compilation on tropical cultured plants; it is a fascinating story of the origin, evolution and domestication of tropical crops based on his intimate contact with native farmers in 3 continents. Critical comments on developmental projects only seen from the western technocratic viewpoint are therefore not surprising. The book is full of suggestions for the introduction and improvement by selection and mutation breeding of less known tropical plants. The representatives of the families of the Solanaceae and Palmae, as well as those of the protein rich wild Leguminosae obtain special attention. Tropical trees and pasture plants are excluded. The material is divided into starch-, protein-, oil-, spice- and stimulantia-delivering plants, tropical fruits and vegetables as well as plants for technical products. Most fascinating are the introductory chapters about plant breeding and selection under tropical conditions. It is striking that the author rejects Vavilov's geographically differential method, and his emphasis on South America as the center of origin of cultural plants. This excellently documented and illustrated book has one drawback which will prevent its world-wide distribution: It is unfortunately not written in either English or Spanish.

H.F. Linskens, Nijmegen

Zeven, A.C., Zeven-Hissink, N.Ch.: Genealogies of 14.000 wheat varieties.

Netherlands Cereals Centre-NCC, Wageningen; CIMMYT, Mexico 1977. 121 pp., Soft bound. Free of charge

From data personally collected during the last 10 years, together with information collected from intensive literature searches and recent inquiries, the authors have compiled a list of some 14,000 wheat varieties, their pedigrees and existing synonyms. The coding system adopted is based on that of Purdy et al. (Crop Sci. 8, 405-406 1968) to be used with typewriter and computer printers. In fact, the list itself is in the form of a computer print-out and provides information on species, backcrosses, distribution of the variety and its habitat. It is an indispensable tool for any wheat breeder.

H.F. Linskens, Nijmegen