

Book Reviews

Jánossy, A.; Lupton, F.G.H. (Eds.): Heterosis in Plant Breeding. Proceeding of the VIIth Congress of EUCARPIA, Budapest, 24-29 June 1974.
Budapest: Akadémiai kiadó 1976. 366 pp., 9 figs.
Bound Ft 220,--

The proceedings of the VIIth Congress of EUCARPIA (European Association for Research in Plant Breeding) in Budapest 1974 finally have appeared after a delay of two years. The general theme of the congress "Heterosis in Plant Breeding" is a subject of paramount importance for the plant breeder, not only as a way for increasing yields, but also "as an efficient grip on his customers" (Mac Key, p. 31). Apparently heterosis breeding is to a large extent a problem of economy too.

In this volume are included reviews and shorter communications. They are related to the following complexes: Genetic principles of heterosis, physiology of heterosis, methods of heterosis breeding, heterosis in out-pollinating species, and heterosis in self-pollinating species. A special chapter contains abstracts of papers submitted to the congress. These 40 papers discuss many theoretical aspects concerning the problems of heterosis breeding. Crops involved in the studies are mainly wheat and less extensively other cereals like maize, barley and rice, some vegetables (tomatoes, cucurbits, onions, carrots, brassica crops), forage crops (grasses, lucerne), and some other species like field beans, strawberries, tobacco, and decorative plants. Most of the papers are very stimulating.

In a supplement to the report of the General Assembly of EUCARPIA, the report of the President (interrupted on page 345 by the unnecessary headline "Biometrics in Plant Breeding"), lists of members of EUCARPIA and of participants of the congress conclude this interesting volume.

K. Hammer, Gatersleben

Straub, J.: Fortschritte in der Kultur von Pflanzenzellen - neue Züchtungsmethoden. Zenk, M.H.: Das physiologische Potential pflanzlicher Zellkulturen.
Vorträge der Rheinisch-Westfälischen Akademie der Wissenschaften N 257.
Opladen: Westdeutscher Verlag 1976. 62 pp., 29 figs., partly in color. DM 28,--

The technique of single cell culture of plant material has been remarkably improved during the last decade. Cell lines have been derived from almost all species. Special attention was given to the production of haploid cell from anthers or pollen grains. The so-called haploid method made it possible to carry out selection processes on the level of sperm cell. So a new method in plant breeding was born; the breeder obtained an easy way to identify homozygote individual, because diploids derived from haploids are always homozygote. As a consequence an important reduction of the number of experiments was possible which shortened the breeding process. Also the conventional method for the production of mutants was improved. Straub showed not only that the expectation that each plant cell, even from corolla or petals, is totipotent seems correct, but also that selection can be made on the cellular level. Further per-

spectives deliver the production of somatic hybrids. The possibility to evade sexual hybridization could mean a revolution in plant breeding. An excellent example of application of suspension cell culture to synthesize secondary plant products (anthroquinones) is described by Zenk. Applying fermentation techniques in using *Morinda citrifolia* as model demonstrates the advantage of cell culture against the field experiments. For the detection and selection of new high yielding cell lines new methods are in progress: application of the radioimmunoassay system seems to offer new unexpected perspectives. Using biotransformation processes in which a given product of low value is transformed by plant cells into a desired product show the cell culture the way the microbiological techniques have been in the past. Given the higher capacity for complicated synthetic pathways of plant cells, the prediction is possible that plant cells in future could take over the position in biotechnology that microbiological systems have occupied up till now.

H.F. Linskens, Nijmegen

Fuchs-Kittowski, Klaus: Probleme des Determinismus und der Kybernetik in der molekularen Biologie.
2nd. Ed.
Jena: G. Fischer 1969. 491 pp., 31 figs.
Bound M 30,30.

As the title indicates, this is a book about philosophy, cybernetics, and molecular biology. It is therefore necessary to make a distinction between the value of the scientific content and the philosophical speculations of the book, although the author constantly intertwines the two subjects.

The work is divided into two parts, the first of which deals with the problem of determinism and the relationship between automata and the living organism, while the second part concerns the mechanism of determinism as related to the control mechanism of the cell and the problem of evolution. The presentation of the scientific information is clear, and the author shows himself well-informed. In fact, the major virtue of the book may well be that the general reader, without extensive knowledge in the scientific matters here discussed, can follow the argument without difficulty and learn a lot about recent science in the process. The short description of the Michelson-Morley experiment is but one among many examples of the clarity of exposition, and of the scope of the book. The reader is introduced not only to the latest research in genetics and to the terminology and principles of cybernetics, but also to the thoughts of scientists turned philosophers, whose ideas the author reflects faithfully, and whose works he quotes often, and sometimes at length. One of the first surprises of the book in this regard is to see a rather sympathetic discussion of the ideas of a christian scientist and thinker, P. Teilhard de Chardin. At the other end of the spectrum, there are lengthy comments on the works of well-known authors such as Monod and Jacob, and many others.

When it comes to philosophical matters, the book presents a special problem, for in it, philosophical speculations are never disconnected from Marxist presuppositions that are taken for granted. This unfortunately may lead the non-Marxist reader to quick-

ly dismiss the entire work as rubbish. Yet, once the irritation over the many dogmatic proclamations of the marxist doctrine are overcome, the book provides ample food for thought.

Fuchs-Kittowski proposes as a solution to the problem of determinism a certain brand of soft determinism. He rejects both the hard determinism of classical mechanism, and indeterminism. This is indeed in line with the official Marxist doctrine. Yet, the author also tries to provide arguments on the basis of cybernetics and of modern physics. He tries to open up the concept of causal necessity by showing that science must admit the existence of 'objective possibilities' (a concept for which he finds the scientific model in the principle of uncertainty). On the other hand, he tries to avoid falling into a teleological interpretation of causality by substituting teleonomy for teleology. In this regard, he feels the threat of being compared with evolutionary finalists (such as Teilhard de Chardin) whose position he obviously must reject.

Unfortunately, in spite of the brave efforts made by the author to find some neutral (i.e. non-Marxist) ground for his solution to the problem, the ultimate explanation goes back to the classical Marxist doctrine that matter is dialectical in nature, which is supposed to explain the opposition between function and structure, and between necessity and accident. Although

here is not the place to discuss this general position, the author's book deserves enough credit to at least briefly make three points concerning his position. The first is that the worn-out opposition between materialism and idealism is more a hindrance than a ground for explaining philosophical problems. There is indeed a common ground between the two, which Fuchs-Kittowski himself points to when he states about the automaton that it "only executes operations (objectified... human activity), it has no objective motives, it does not know what it executes; ... what it realizes, has no meaning for him - it has no consciousness" (p. 458). The question is not to proclaim the supremacy of matter or of spirit, but to explain that there is meaning. Secondly, although cybernetics provides a useful model to study the complex structure of living matter, it should not be forgotten that the terminology of this new branch of science is heavily indebted to the human experience, a fact which invites anthropomorphism on a large scale. Thirdly, it is a similar projection of the human experience, viz. the experience that knowledge can advance only at the cost of making mistakes, i.e. that truth demands untruth, which led to attributing this property to matter, on which level it loses all meaning. Such projections in the long run unfortunately explain little or nothing.

G. Debrock, Nijmegen

Announcements



XIV. International Congress of Genetics Moscow, August 21-30, 1978

The Congress is organized by the Academy of Sciences of the USSR and the N.I. Vavilov Society for Genetics and Selection. The Congress is held under the auspices of the International Genetics Federation (IGF).

Details of the program have become known.

The Plenary Session will have the following topics:

- Genetics and Human Welfare
- N.I. Vavilov Heritage in Modern Genetics
- Problems of Molecular Genetics and Gene Structure in Higher Eukaryotes

The Plenary Symposium will treat the subjects:

- Current Problems in Genetic Bases of Selection
- Genetics and the Problems of the Biosphere

The Symposia have the following themes:

- Genetic Control of Transcription
- Genetic Control of Translation
- Genetic Recombination
- Molecular Mechanisms of Mutagenesis
- Genetics of Repair
- Genetics of Plasmids
- Gene Engineering
- Chromosome Structure and Function
- Extrachromosomal Inheritance
- Genetics of Isoenzymes
- Developmental Genetics (Animals)

- Developmental Genetics (Plants)
- Genetic Control of Mitosis and Meiosis
- Genetics of Somatic Cells
- Genetics and Cytogenetics of Malignant Growth
- Problems in Evolutionary and Populations Genetics
- Human Genetics
- Behaviour Genetics
- Genetics of Endocrine Functions
- Immunogenetics
- Genetics of Plant Resistance to Diseases
- Genetics of Photosynthesis
- Genetic Bases of Animal Breeding
- Genetic Bases of Plant Breeding
- Genetics of Industrial Microorganisms

The Presidium of the 14th International Congress of Genetics will consist of: N.V. Tsitsin (USSR), president; and the vice-presidents: H. Böhme (DDR), A.R. Cordeuro (Brazil), J.F. Crow (USA), C. Daskalov (Bulgaria), N.P. Dubinin (USSR), J. Lejeune (France), A. Lundquist (Sweden), G. Sermoniti (Italy), M.S. Swaminathan (India), Y. Tazima (Japan), M.D. White (Australia).

D.K. Belyaev (USSR) will function as Secretary General, with the secretaries L.I. Korochkin, R.V. Petrov and M.E. Vartanian (all USSR). The Second Announcement leaflet can be asked for at the Organizing Committee: N.I. Vavilov Society for Genetics and Selection, 11 Fersman Street, Entrance 4, 117312 Moscow, USSR. Tel.: 135-40-61; 135-71-24