

## Book Reviews

Ellenberg, H.; Esser, K.; Merxmueller, H., Schnepf, E.; Ziegler, H. (Eds.): Progress in Botany (Fortschritte der Botanik).  
Berlin-Heidelberg-New York: Springer 1976. 377 pp., 22 figs. Bound DM 120,--

The new volume of "Progress in Botany" reports on the essential results botanical research brought during 1975 to 1976 in morphology, physiology, genetics, taxonomy and geobotany.

Results of morphological and biochemical analysis of cytology are put together by Franke, Morre, Harth, Zerban and Drews p.ex. the structure of Golgi-apparatus, membranes especially of procaryotic cells and the organisation of eukaryotic algal cells. The results on higher plants also concern structures of cellwalls and of epiderm. Contributions to knowledge of reproductive organs of higher plants are given by Hagemann.

Physiological studies concern analysis of phythemglutinins, report given by Kauss, and of short and long distance transport of minerals, given by Marschner. In this last chapter genetic aspects of photosynthesis is referred to in a special section by Latzko and Gahame. Besides that on experiments about developmental physiology, with 13 pages it is the largest section. Fellenberg informs about the relation between light and development, about the question of flower-induction, here especially about the effect of hormones, about the development of cellwalls and finally about adventive root-formation in relation to organ- and tissueculture which gather more and more importance. A summary of genetical problems is given by Rhaese, Herzfeld, Michaelis, Blaich, Lichter and others. It is certain that the special function of "Progress in Botany" is not only to resumé the results of botanical research, but also to report on other spheres of biological science that are of importance to botanists. The important results of mutation-research, especially about the relation between mutationinduction and repair, as on the function of the genetic material of eukaryotes, are discussed on the base of results obtained with microorganisms or zoological systems like *Drosophila*. The studies of repetitive and non-repetitive DNA-sequences in the chromosomes in giantchromosomes are very important. The possibility of using different objects to gain knowledge through cloning specific DNA-sequences with the help of microbial genetic entities as plasmids is demonstrated. Michaelis reports on extrakaryotic genetical systems and gives a summary of the experiments concerning the chondriom. Genetics of chloroplasts have been reported in detail in volume 37 of this periodical. Papers on genetic control of reproduction are summarized from the last 10 years. Problems of population genetics are referred to under consideration of genome-status. These results are partly based on mathematical models, partly on artificially constructed populations.

The sections on taxonomy (Mollenhauer, Müller, Hertel, Schultze-Motel, Meyer) particularly treat lower organisms like algae, fungi and lichen, as well as mosses and ferns. In the passage on geobotany (Jäger, Frenzel, Knapp) are discussed floras, history of flora during the quaternary, as well as sociological research. The last chapter contains the report on results of experimental ecology (Schmidt).

On the whole this volume shows us that differentiation in science, as outlined here especially in botany, grows permanently. On account of this it is simply impossible to realize a complete and unitary picture.  
Ursula Nürnberg, Alt Ruppin (DDR)

Thiessen, G.; Thiessen, H.: Microspectrophotometric Cell Analysis.  
Stuttgart: G. Fischer 1977. 158 pp., 92 figs., 14 tabs. Soft bound DM 74,-

Both in applied and in fundamental cytology there is an ever growing need for methods to describe and analyse more objectively microscopic images than is possible with the human eye. Newly developed optical and, even more, computer-aided systems have great potentials to achieve this purpose. In Thiessen and Thiessen's book the reader is told of a number of methods with which subjective cytological impressions can be translated into numerical values and analysed with the help of a computer. Particular attention is paid to CYTOS, a "cyttopographic system" developed in the institute in which both authors work. The organization and function of CYTOS are discussed in a general introduction in which the scanning equipment and the task to be carried out by the computer are described extensively. The numerous photographs, often in colour, showing the effect and value of image transformation by the computer are very illustrative.

With descriptions of personal studies the authors then treat the theoretical and practical aspects of the microspectrophotometric approach to many problems such as autoradiography, quantitative estimation of cellular substances and enzyme activities, and radiobiology. An important part of the work deals with ultraviolet microphotometry with emphasis on the measurement and the effect of UV-irradiation to which the cells, also during the application of the measuring technique, are exposed.

The chapter on the use of the CYTOS technique to detect radiation-induced chromosomal aberrations had my special attention. Although I have seen in their book how accurate and detailed the analyses with this technique can be, I cannot, as a cytogeneticist, agree with the authors' remark that: "Statements based on findings with the optical microscope are insufficient as far as the objective representation of the karyotype is concerned" (p. 92). They apparently are forgetting the many new chromosome banding techniques which have greatly improved the routine microscopic analysis of karyotypes.

The discussion of the geometrical aspects of microspectrophotometry, supported with diagrams, should be named especially. The subject has become particularly up to date in view of the fact that a recent microfluorometric study of spermatozoa has clearly shown that the shape and the spatial arrangement of microscopic objects may strongly influence the measured values.

Finally, the authors outline the developments in the field of automatic cell analysis which are of special importance for their possible use in cytopathology, cytogenetics and the early recognition of malignancies. The applicability, and the advantages and disadvantages of the various systems such as the rapid Flow or Pulse cytofluorometry and the scanning methods are com-

pared and classified according to their resolving power (Zero-, low-, high-, dual-, and triple resolution systems).

The book is useful for those wishing to be informed of the present possibilities in the rapidly developing "cytotechnology". In addition, its extensive theoretical treatment of the subject and the description of recent studies of these experienced investigators will make their book interesting for the growing number of scientists active in the field. J.M.J. Scheres, Nijmegen

Frankel, R.; Galun, E.: Pollination Mechanisms, Reproduction and Plant Breeding.

Berlin-Heidelberg-New York: Springer 1977. 281 pp., 77 figs., 39 tabs. Bound DM 60,-

Plant breeding is based on the knowledge of pollination mechanisms and reproduction to a considerable part. Though there have been many efforts to construct the theoretical background in pollination ecology and reproductive biology, their importance in the applied field was recognized increasingly only in the last years. Therefore a review of these problems in relation to plant breeding may be of great interest for plant breeders but also for agriculturists, botanists, and geneticists, and this comprehensive book has to be welcomed.

The book consists of three parts, the first of which approaches pollination mechanisms, modes of reproduction, and ecology and dynamics of pollination. In the second part problems connected with autogamy and handling of autogamous crops in breeding procedures are described. The third part, under the headline "alogamy", is the most comprehensive one. In detail sexual reproduction in higher plants is discussed (included are also anther and pollen culture methods) and mechanisms are described which prevent self pollination: sex expression, incompatibility, and male sterility. The utilization of these mechanisms in plant breeding is especially interesting at present because of the increasing importance of hybrid seed production. It is not easy to make a concise and at the same time comprehensive compilation of such an amount of themes and problems. Naturally there occurs shortage of information in some cases. But there should be detailed information on newer ideas and trends. It's a pity that this demand could not be fully realized, as the following example demonstrates. Under the headline "use of chromosomes", there are only some general remarks on possibilities concerning hybrid seed production in barley mainly. There is no notice about the fact that vitality in balanced tertiary trisomics in barley having relatively long extra chromosomes under average conditions is reduced. Shortening of the extra chromosome increases vitality of plants, but the small extra chromosome can then be transmitted through the pollen and the system breaks down. In this connection new ways, like the use of haplo-viable mutants, are not mentioned.

The book is well illustrated and brings also much detailed, useful tables with examples mostly drawn from cultivated plants. In some cases it would be better to arrange all corresponding facts from the book into the table concerned, e.g. into table 3.6. "genetics of sex in some economic crops" should be included items from pages 119 f. and 140 f. concerning *Rumex* and *Vitis* respectively.

As a good source of information concerning pollination mechanisms and reproduction in relation to plant breeding, the book will be of great use for the interested reader. K. Hammer, Gatersleben

Fahim-Tansch, L.: Einfluß der Tageslänge auf die Entwicklung und den Ertrag des Rotklee (*Trifolium pratense* L.)

Wien: VWGO 1976. 203 pp., 37 figs. Soft bound öS 205,-

With respect to the photoperiodic response red clover belongs to the group of long day plants. In the present Ph. D. thesis the photoperiodic response of red clover has been investigated with the aim of finding cultivars more suitable to be cultivated in geographic regions with relative short day length. Plant height, number of leaves and stalks, dry weight harvest and amount of some elements, e.g. N, have been used as the main characteristics. 3 cultivars have been compared under conditions of different day length (12, 14 and > 15 h, respectively). The long day response of red clover has been confirmed, but some variability has been found with respect to the 'critical day length'.

The thesis is introduced by a review on photoperiodism of crop plants (40 pages). Subsequently, the results are presented on 135 pages, including a large number of tables and graphs. Nearly all experimental dates are presented minimally 3 times, as tables, as graphs, and once more as tables, but now including dates of statistical evaluation. This manner of presenting the results has generated a disproportion between number of pages and experimental results of the thesis. The introductory theoretical parts are not free of repetitions either. The discussion of the results has been restricted to 10 pages. The bibliography consists of approximately 120 references. The thesis has been printed in offset. Some pages are illegible.

The thesis will be of interest for institutes dealing with cultivation and breeding of red clover.

K. Müntz (Gatersleben)

Bargmann, W.: Histologie und Mikroskopische Anatomie des Menschen. 7. Ed.

Stuttgart: G. Thieme 1977. 757 pp., 700 figs. Hard bound DM 98,-

Since the first publication of this book 20 years ago histology and especially electronmicroscopical histology made encouraging advances and many gaps of knowledge have been closed. Today this book is a standard comprehensive reference work for all users of microscopical human anatomy, medical doctors, students, anatomists and biologists. The 7. revised edition deals with the recently detected C-, G- and Q-. Banding of chromosomes as well as the latest results in neurohistological research. Several methodical procedures are given in all detail. The book presents not only the basic knowledge but emphasizes especially the physiological and functional mechanisms relevant to these fields. The text is completed with excellent in part coloured figures. It contains guiding literature references at the end of each chapter. Special emphasis has been attached to clearness in such a way that a modern, didactically exemplary introduction to the histology and ultrahistology of man is presented. H.-A. Freye, Halle-Wittenberg