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 Book reviews
 

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**Leibenguth, F.: Züchtungsgenetik.** Stuttgart, New York: Thieme 1982. VI, 266 pp., 97 + 157 figs and plates, 61 tabs. Soft bound DM 29.80.

A discussion of this "Breeding Genetics" has to consider the reasons that have stimulated the author to produce this book. First of all, he is convinced that "also from the applied side, can genetics be learned quite well". Secondly, he wanted to take into account the fact mentioned by him that "students always have a subconscious need for the practical aspects" of the classical study of heredity which only operates with a limited number of academic models". In this way a textbook originated which discusses in paperback size on 266 pages – and in astonishing detail – the chapters "Diversity of forms and breeding", "Breeding by selection", "Breeding by crossing", "Heterosis Breeding", and "Mutations and breeding". According to the above mentioned intentions the basis of genetics is thereby treated nearly exclusively with the help of examples from the breeding of domestic crops and animals. This presentation rapidly leads to such difficult, and at the same time important, procedures as the heritability estimation for the productive qualities of domestic animals, which is treated within the chapter "Breeding by selection for quantitative properties".

Leibenguth presents a detailed picture of heterosis-breeding not only for self- and crossfertilizing crop plants but also by using examples of inbreeding depression and heterosis for chicken, pig and cattle. A summary of the theories of the heterosis effects represents a very valuable conclusion of this chapter. The significance of mutations for breeding is shown in the usual way: first of all with the genome – mutations in close connection with species – and secondly with genus hybrids. The *in vitro* hybridization of somatic cells and, connected with this, an indication of the possibilities for gene transfer are inserted here. New for a textbook is the presentation of such chromosome mutants and mutants of aneuploid nature which have become important in animal breeding. Some good illustrations with karyograms and metaphase plates of the dog, cow and pig complete the description.

The practical oriented textbook is based upon experiences which the author has been able to collect during many years of teaching at the Saarland University. This clearly went hand in hand with an exemplary thorough and detailed understanding of the relevant original breeding literature in both kingdoms of higher organisms. Added to this is the study of the relevant manuals and already existing genetics and breeding textbooks. Even the developments in breeding genetics of the last years have not been omitted; both haploid breeding and the description of embryo transfer in cattle are

included. In every instance, great emphasis has been placed upon practical application. In this way, the reader even becomes aware (page 175) of the successes of the "Bundeshybridzüchtungsprogramm" of the "Züchtungszentrale Deutsches Hybridschwein GmbH".

A review of this new edition should not neglect what the author has stated at the beginning of the preface: this "breeding genetics" has been written by a non-breeder. When considered in this way the complete work deserves our admiration. Nevertheless, the confessed non-breeder exposes himself to the recognizable danger of not being able to separate chaff from wheat in the literature study. Unfortunately this applies here. Take for example, the presentation of a selection of "monogenically determined self- and cross-fertilization characteristics (Mandy)". It is not correct, as table 2.11 on page 47 indicates for rye, that the different properties of early ripening-late ripening or summertypewintertype are each monogenically determined. Breeders could tell many a story about the very complex segregation of such crosses! In the presentation of self-incompatibility a mistake has also crept in. Here it is said that "when in an exceptional case fertilization ensues, the zygote and the young embryo are aborted". In fact, one can obtain seed formation and fully developed homozygous self-sterile plants after self-pollination, as long as by an appropriate trick the filter of developmental physiology has been avoided.

As a last point, the reviewer has to answer the question whether the goal that the author has set himself has been reached. Without any doubt this "breeding genetics" is a gold mine for everybody who wants to penetrate on his own into the field of breeding-genetics or into individual parts of it. However, whether through this work this "fascinating area of applied science" becomes completely understandable to "an interested layman" to whom Leibenguth especially addresses himself, seems doubtful. One has to be an eminently educated layman to completely understand for example the mutagenic action of nitric acid (page 190, fig. 5.2). In the same way, the biology student will only with great difficulty be able to absorb the many details in such a way that they will serve him well arranged and fully understood as part of his knowledge.

But perhaps these doubts will only arise in a scientist who had the luck to learn genetics with the help of a presentation which was well reflected upon, and composed after careful selection, in the way Alfred Kühn has offered in his "Grundriss der Vererbungslehre" and with which he brought genetics together for more than a generation of students thanks to his extreme didactic skill and the transparency which went with it.

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