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EMBRYOLOGICAL ASPECTS OF HYBRID VIGOR IN PINES[1]

By Professor JOHN T. BUCHHOLZ

UNIVERSITY OF ILLINOIS

THE hybrids between some species of pine afford excellent examples of hybrid vigor in the F_1 generation of the cross. During recent years, demonstrations of this hybrid vigor in pines have been made in the nursery of the Institute of Forest Genetics at Placerville, California. The hybrids concerned are not the result of crosses between inbred strains of a species but are the hybrids between species and between varieties. Hybrid vigor has been observed in F_1 plants from the crosses: *Pinus monticola* × *P. strobus; P. Jeffreyi* × (*P. Jeffreyi* × *P. Coulteri*) the latter a natural hybrid; *P. Murryana* × *P. Banksiana;* between certain geographic varieties or races of *P. ponderosa* and in other combinations. In seedling stages, some hybrids have exceeded the growth of the parent species by an amount that appears to be much greater than that of maize. Righter[2] has given a few performance records over a 3–4 year period of some of these hybrids, which have greatly exceeded the wind-pollinated parents.

The possible manifestation of hybrid vigor during development of the embryo became a subject of special interest to the writer, while he was visiting investigator at the Institute of Forest Genetics, for several months during the summers of 1942 and 1944.

[1] Contribution in lieu of his address as Vice-president and Chairman of Section G (Botanical Sciences) for 1942, American Association for the Advancement of Science.

[2] F. I. Righter, *Jour. Forestry,* 43: 131–137, 1945.

many applications, smaller expected frequencies still lead to satisfactory tests of significance. Data on the growth of maize are fitted with a polynomial curve, although the equation has no obvious biological interpretation. Because they are easy to handle statistically, polynomial curves are often computed without regard to their physical meaning. Their chief descriptive value is in indicating how many fitted constants may be needed in a rational equation which would define the relation. These limitations have been overlooked. A number of misprints have crept into the text, sometimes into equations. Presumably, they will be corrected when the book is reprinted. It is to be hoped that later editions will include some of the important topics which have been omitted, such as the analysis of experiments with missing values, transformations to stabilize the variance, the χ^2 test for homogeneity of the variance, tests for normality and a more critical discussion of the errors which are pertinent for the different comparisons of a complex experiment.

C. I. BLISS

NEW HAVEN, CONN.

ANTIBIOTIC AGENTS

Penicillin and Other Antibiotic Agents. By WALLACE E. HERRELL. 348 pp. Philadelphia and London: W. B. Saunders Company. 1945. Price $5.00.

DURING the last five years, penicillin has attracted world-wide attention. Ever since its discovery and description by Sir Alexander Fleming, of St. Mary's Hospital in London, in the year 1929, there has been some interest in this substance, but it required the stimulus of a war to develop it to its present stage. The demonstration by Florey and his group of associates that penicillin could be produced in a form that was non-toxic to man, and that it could be used effectively in the treatment of staphylococcic infections, stimulated others to study this substance further. The development of penicillin from a laboratory curiosity to the present stage of mass production has been one of the great scientific achievements of our time. It is one of the outstanding examples of collaborative efforts on the part of governmental agencies, private industry and university and hospital personnel and laboratories. The results speak for themselves. There is no drug that can do as much for so many different infections and cause no harm to the patient. When one considers this agent is effective against the two most prevalent genitoinfectious diseases, as well as many disorders caused by gram positive microorganisms, it is possible to classify penicillin as a truly remarkable drug.

In this monograph, Dr. Herrell has summed up his own experience with penicillin and reviewed the published work of many others. There are a number of excellent illustrations and charts, and the material is well organized and presented in a manner that is pleasing to the reader. Dr. Herrell's wide experience in this field has made him peculiarly fitted to present the subject in a thoroughgoing manner.

All physicians will want to read this monograph, which gives the results of the treatment of many diseases. A wealth of material is now accumulating in such clinical disorders as war wounds, syphilis and bacterial endocarditis, and while the early published results are most impressive, it is not possible at this time to assess the final results in such diseases as bacterial endocarditis and syphilis.

This monograph, then, can not be recommended too highly. The printing is of high quality, the bibliography is comprehensive and the index is good. Finally, the content makes excellent and satisfying reading.

CHESTER S. KEEFER

EVANS MEMORIAL HOSPITAL,
BOSTON

WEEDS

Weeds of Lawn and Garden. By JOHN M. FOGG, JR. 215 pages. Philadelphia: University of Pennsylvania Press, 1945. $2.50.

THERE must be thousands of victory gardeners who are taking the hard way to get acquainted with weeds. If any of them desire to know the names, the habits or the origin of our common weeds, they will find a convenient means in Dr. Fogg's book. Here they will find notes on 242 different kinds of them and for almost every kind a non-technical description and an excellent half-page illustration. Often the young stages of the weed are shown, which is an especially valuable feature for the gardener. An introductory chapter discusses why some plants are weeds, how they are so widely and quickly dispersed over the country and how they may be exterminated.

H. A. GLEASON

NEW YORK BOTANICAL GARDEN

BOOKS RECEIVED

HOLMBOE, JÖRGEN, GEORGE E. FORSYTHE and WILLIAM GUSTIN. *Dynamic Meteorology.* Illustrated. Pp. xvi + 378. John Wiley & Sons, Inc. $4.50. 1945.

HOLMES, HARRY N. *Qualitative Analysis; A Brief Outline.* Ninth edition, revised. Pp. vii + 52. The Macmillan Company. $1.10. 1945.

LOWRY, H. H., Editor, for the National Research Council. *Chemistry of Coal Utilization.* Illustrated. Vol. I, pp. 920. Vol. II, pp. 921–1868. John Wiley & Sons, Inc. Two volumes, $20.00. 1945.

STRECKER, EDWARD A., and KENNETH E. APPEL. *Psychiatry in Modern Warfare.* Pp. viii + 88. The Macmillan Company. $1.50. 1945.

THOMPSON, PAUL V., Editor. *University of Colorado Studies; Series D, Physical and Biological Sciences.* Pp. 55–293. The University, $1.00.