the preface, include the material that the author thinks should form the basis for an elementary descriptive course in meteorology. These can best be summarized by listing the chapter headings and adding a few comments where the chapter headings need to be supplemented.

The first five topics are concerned with the basic principles of meteorology and provide the background for the descriptive material presented in the remaining portion of the book. These five topics are: (1) "The Composition and the Vertical Extent of the Atmosphere," in which the hydrostatic equation is also introduced and integrated; (2) "Adiabatic Processes and the Vertical Stability of the Atmosphere," which also includes a discussion of adiabatic diagrams; (3) "The Heat Balance of the Atmosphere and the Explanation of the Observed Temperature Distribution"; (4) Evaporation and Condensation in the Atmosphere"; (5) "Wind Velocity in the Atmosphere."

The latter half of the book is given over to the remaining six topics, which fall into a class generally referred to as synoptic meteorology. These six topics are: (1) "The General Circulation of the Earth's Atmosphere," which also includes a discussion of "high and low index" conditions; (2) "The Secondary Circulations of the Thermal Direct Type," where a detailed description of hurricanes is also given; (3) "Air Mass Characteristics"; (4) "Secondary Circulations of the Dynamic Type," which mainly discusses fronts and wave cyclones; (5) "The Tertiary Circulations"; and (6) "The Synoptic Representation of Current Weather and the Forecasting of the Future Weather," where the author gives a few examples of weather analysis and merely surveys the field of weather forecasting.

For the most part, the equations presented are derived from first principles. No derivations, however, are given for the formulas for specific humidity and mixing ratio. In the case of mean molecular weight of air, the method by which the value is determined is not given. It is believed that the addition of the foregoing would be very useful to the reader in understanding these concepts.

Some material has been omitted which most meteorologists would probably want included in a text of this nature. No mention is made, for instance, of wet-bulb temperature, equivalent-potential temperature, snow pellets and small hail. Occasionally technical terms with which the beginning student would not be familiar are introduced with insufficient discussion. These include such terms as front, frontogenesis, entropy, convergence and divergence.

The description of a hypothesis for the development of hurricanes and the material on air mass characteristics are given in great detail, probably in greater detail than is necessary in an elementary book, but little mention is made of the weather and the causes of weather in the tropics. The intertropical front, or convergence zone, and wave disturbances in the easterlies are given no attention. In describing the characteristics of occluding wave disturbances, a large amount of material is included concerning the developments at the surface, but completely lacking is a description of developments aloft except for that which concerns frontal structure. These are considered to be important omissions.

One might object to the phrase, "the capacity of air to hold water vapor," as it is misleading; to the rather unusual integration of the hydrostatic equation; or to the statement, "the particle rises along its own particular dry adiabat," instead of, the particle cools at the dry adiabatic rate. Some would probably consider these to be rather minor objections.

In spite of the above criticisms, it is believed that this text is of much value, as it is one of the few meteorological texts designed for use in undergraduate courses where the students have had preparation in college mathematics and physics. The author has purposely not attempted to cover the field of weather forecasting in a chapter or two, as has been done in numerous elementary texts, and for this he is to be complimented. The subject-matter is well integrated, giving the book good continuity.

The book as a whole gives the impression that the author has published it only after much thought and careful preparation, and it is indeed a welcome contribution from the standpoint of those concerned with meteorological education. It should prove very useful to people giving courses on the level for which the book has been prepared.

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PLANT GROWTH

Plant Growth. By L. EDWIN YOCUM. 192 pages. 16 plates. Cloth. Lancaster, Pa.: The Jaques Cattell Press. 1945. $3.00.

IN the words of the author, "This book has been written in an attempt to bring together the knowledge necessary to answer (as far as possible) the many technical questions which the plant lover may ask about growing plants. It is an attempt to make clear the 'how and why' of plant growth. The principles of the laws of nature as applied to plants growing in the soil are stressed. Many of the newer theories used in plant culture are described; others, not so well established, are suggested as possible future developments.

The illustrative material has been selected, when possible, because it is found around most homes, and can be examined by the reader."

Written for the layman, this book describes processes of plant growth from the time of seed germination through the fruiting stage. It contains morphological descriptions of the organs of the plants with a brief account of their functions. The main portion of the book deals with the physiological relations of the plant to its environment. Material on the absorption of water and minerals, photosynthesis and transpiration, is handled in a standard way with practical suggestions. The practical aspects of grafting, budding, propagation, mulching, soil improvement, weeds, entomology and plant diseases are described. The author endeavors to give the reader an intelligent approach to his own problems and an appreciation of scientific aspects of plant study.

A comprehensive account of Mendel's work on the pea introduces genetics and aids in the following discussion on heredity and variation of plants. In fact, this part is well told in succinct detail. To each chapter is attached a list of references that may interest the individual who is more curious about the various phases of the plant. These not only include the standard botanical texts which are found in high-school and college classrooms and libraries but the *Botanical Review* and the publications of the U. S. Department of Agriculture which bring the references up to date. The book is readily understandable and will be welcomed by lay readers interested in a non-technical description of recent advances in our knowledge of plant growth. This book promises to be a very successful member of the publisher's series of texts for popularization of science. The format is attractive, the text is accurate and the style is interesting, dignified and free of the all too frequent attempts to sensationalize the importance of recent research.

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BOVINE TRICHOMONIASIS

Bovine Trichomoniasis. A Monograph on *Trichomonas foetus.* By BANNER BILL MORGAN. 150 pp. Illustrated. Minneapolis, Minn.: Burgess Publishing Co. 1945. $3.25.

Trichomonas foetus infects the bovine genital tract of both sexes and lowers fecundity. Thus the disease has an immediate effect on milk production and eventually limits the supply of beef. In view of war-time experiences with rationing of these foods the timeliness of the author's monograph needs no emphasis. In addition, the disease is venereal and from the cattle raiser's standpoint this is its most serious aspect since the bull, having a value "equal to that of half of the herd" must be sacrificed with the consequent loss of invaluable hereditary qualities.

A remarkable feature of the literature on *T. foetus* is its recent appearance. Of 408 citations by the author of the monograph all but 3 were published since 1925. Failure to discover the importance of genital trichomoniasis prior to that time was due in part to a general misconception concerning *Brucella abortus* (Bang, 1897), which was regarded as the sole causative agent of bovine infectious abortion. Success in demonstrating the importance of the trichomonad infection was attained by several veterinary practitioners in Switzerland and alpine regions of Germany who were confronted with problems of abortion and sterility in "Bang-free" cattle. When these men examined fresh genital exudate with reduced illumination under the low powers of the microscope they found the fluid teeming with *T. foetus.* This parasite had escaped detection by numerous experts in examinations of stained smears under oil immersion. Since 1925 the distribution of the genital trichomonad infection has been found world-wide and, as indicated in the monograph, has been the subject of many investigations.

The monograph, comprising 12 chapters, is an accurate, unbiased discussion of all available literature on the subject. The work might have been improved by more attention to the plan of its organization. For example, the chapter on "Morphology and Life Cycle" contains practically nothing concerning the life cycle of the parasite. This topic is discussed under "Transmission" in the chapter on "Symptoms and Lesions." It appears also that the data in the chapters on "Cultivation" and "Hydrogen-Ion Concentration" might well have been discussed in a chapter entitled "Physiology." As the volume stands, "Cultural Physiology" is discussed in a chapter entitled "Miscellaneous."

These criticisms do not detract markedly from the value of the monograph, and the present writer is in full accord with the following statement in the "Foreword" by Dr. W. L. Boyd: "Students of veterinary medicine, practitioners of veterinary medicine, and all others interested in developing a more healthful and therefore a more prosperous animal husbandry will find this contribution most helpful."

CHAS. W. REES

BOOKS RECEIVED

FENICHEL, DR. OTTO. *The Psychoanalytic Theory of Neurosis.* Pp. x + 703. W. W. Norton and Company, Inc. 1945.

BERGSON, HENRI. *The Creative Mind.* Pp. 9 + 307. Philosophical Library. 1946.

STIEGLITZ, DR. EDWARD J. *A Future for Preventive Medicine.* Pp. xvi + 77. The Commonwealth Fund. $1.00. 1945.