It must be confessed that, even with the outstanding and impressive job performed by the authors, the organization of the total body of ecological principles leaves something to be desired. As in reading the dictionary, one tends to lose the thread of the story in the mass of detail. Perhaps the method of composition, by a board of five outstanding and able authors, each with a lifetime of facts, experiences, and observations to place at the disposal of the group, makes inevitable some roughness in spite of the obvious and laborious effort to assure coherence and literary excellence. In this connection the method of work followed is of interest. First the different authors prepared the separate chapters. Eventually all parts of the manuscript were read aloud to the other authors and there was much discussion of questioned points. The result is an extraordinary accumulation of detailed facts, generalizations, and documentations. If the text lacks somewhat in smoothness or in literary felicity, it is quite understandable. Perhaps if one of the distinguished authors would now take the book and rewrite it from a synoptic view, shortening it somewhat, we could count on more rapid appreciation of it by the scientific and general public. But this reviewer does not want to leave the impression that anyone should undervalue the book. Its publication marks a great advance.

WALTER P. TAYLOR

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Webs in the Wind: The Habits of Web-weaving Spiders. Winifred Duncan. New York: Ronald Press, 1949. 387 pp. $4.50.

American Spiders: A Guide to the Life and Habits of the Spider World. Willis J. Gertsch. New York: D. Van Nostrand, 1949. 285 pp. $6.95.

Here are two books on spiders, so completely different that there is no question of comparison. Miss Duncan is primarily interested in the work of spiders and not in the spiders themselves. Dr. Gertsch is interested in the spiders themselves and looks upon a knowledge of their works and ways as necessary for their complete understanding.

Miss Duncan admits, in the foreword of *Webs in the Wind,* that she knew nothing about spiders when she started to observe them and their daily life. She chose spiders because "they are the only creatures which are full of activity and variety, and yet sedentary. Also ubiquitous." For two years, part of which was spent in New England and California and part in Mexico, she has watched and sometimes sketched those spiders and webs which have come to her notice. The inevitable result of such a program is a little here and a little there but no picture even approximately complete. This is not intended as criticism, for Miss Duncan makes no pretense that she has written an exhaustive treatise for arachnologists; it is rather a story that has been fun to write and will be fun for others to read. As such, her book is a success though some readers will regret that the identities of many of her pets are unknown.

Dr. Gertsch, who has charge of the spider collection of the American Museum of Natural History, chose to write about spiders because he knows about spiders. He is most interested in their classification and so his book is somewhat weighted in that direction. And since a proper classification of any group of animals must take into account not only the physical forms of the members of the group but also the habits and modes of life of the different species, he has included chapters dealing with the life of the spider, spinning, dispersal, courtship and mating, evolution and economic and medical importance. Other chapters deal with the major groups of the spiders themselves. The average reader will probably find the chapters on courtship and mating and economic and medical importance the most interesting. The fantastic nuptial dances of the male jumping spiders seem reasonable when one realizes that until the male has fully identified himself to the female, he is in constant danger of being killed and eaten by his mate. As to the medical importance of spiders in this country, Gertsch comes to the conclusion that only the black widows (*Latrodectus* spp.) are dangerous, and even these not as dangerous as the public in general considers them.

The 64 plates, half of them in full color, add very greatly to the pleasure of the reader. The author is indeed to be congratulated on getting together such a wealth of excellent pictures. The reviewer thinks that it would have been better if the plates had been numbered consecutively instead of in two series, but that is really a minor point. More important, it would seem that more should have been written about the enemies of spiders.

EDWARD A. CHAPIN

U. S. National Museum

Irrigated Soils: Their Fertility and Management. D. W. Thorne and H. B. Peterson. Philadelphia: Blakiston, 1949. 288 pp. $5.00.

The objective of these two Utah State Agricultural College authors was to write a textbook which would provide a source of information on those soils upon which more than one-half of the world's population is dependent, the irrigated soils. They assume that the reader has an elementary knowledge of botany, chemistry, mathematics, and physics and is familiar with concepts of pH, basic exchange, and physical properties of soil.

Some of the topics treated in the 25 chapters are: his-

tory and extent of irrigation, characteristics of arid region soils, soil moisture, plant-soil-water relations, evaluating land for irrigation, source and quality of irrigation water, measurement and application of irrigation water, irrigation practices for various crops, drainage reclamation, land evaluation, nutritional problems, and soil management for specific crops.

In this clearly written, well-illustrated book the authors have attempted to cover too much ground for a textbook to be used by students whose major subject is soils. But it should find wide use in vocational schools and as a handbook for those giving technical advice to farmers.

Along with its fine qualities, the book has some shortcomings. The statement is made that modern irrigation practice began in a specific year. In a practice as old and widespread as irrigation, transitions are gradual and take place over wide areas. In the discussion of soil moisture no credit is given to Buckingham for initiating the concept of capillary potential.

The book provides an excellent up-to-date appraisal of the problems associated with the management of irrigated soils, and should therefore find a wide reading public.

M. R. HUBERTY

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Elementary Plant Physiology. Stuart Dunn. Cambridge, Mass.: Addison-Wesley, 1949. 164 pp. $3.50. Laboratory manual to accompany text $1.00.

This "brief text," as the author describes it, is exactly that, and as such stands out in sharp contrast to such standard works as those by Miller and by Meyer and Anderson. (Oddly, there is no reference to the second text throughout Dunn's book.) *Elementary Plant Physiology* is the type of text which schools of applied science, such as agricultural colleges, have needed for some time. The general field of plant physiology is adequately covered for a one-semester or one-quarter course.

One virtue of such a short text is that it allows time for discussion and for the review questions at the end of each chapter, which appear to be excellent quizzes for the student on the material just covered. As the author explains, literature citations and bibliography are intentionally brief; however, considering the brevity of the text, they are probably adequate.

When it comes to judging the actual make-up of the book, one can cite both virtues and what appear to be serious failings. The order of chapters is both logical and continuous (structure, absorption, transpiration and translocation, mineral nutrition, photosynthesis, organic constituents, respiration, and growth and movement). To cite a few examples, in Chapter 3 (absorption) the explanation of osmosis and diffusion are extremely clear, simple, and concise, and good examples are used. On page 28 under methods of measuring osmosis the author points to the errors in interpretation of data obtained by the cryoscopic method. Such cautions in a brief text of this nature are well taken. On the other hand one wonders whether in an elementary text an explanation of Donnan equilibrium is advisable, especially in light of the pros and cons to the theory in present-day literature. In certain instances explanations of phenomena are so brief that their value is questionable (e.g., the discussion of the "Perimeter Law" and the researches of Brown and Escombe, attempted in half a page). There is an excellent diagram of a corn plant and the several loci for detection of absorbed radioactive elements in the plant (p. 60). (It does, however, include a slight error, designating intercellular space as stoma.) Chapter 5 (mineral nutrition) is excellent for its general completeness and clarity of explanation and example. The brief historical reviews of such major topics as solution culture (called water culture here) are good aids to further understanding of the subject, as is Chapter 6, on photosynthesis. One might quarrel with the use of the word *function* in relation to the mere *presence* of mineral elements in plant constituents, in contrast to cases where they do have definite physiological functions (e.g., Fe in chlorophyll synthesis, K in protein synthesis, etc.), but this is general throughout plant physiology texts. Although the chapter on photosynthesis is moderately brief, it seems to cover adequately the cardinal points of pigments, factors, conditions, and mechanism. Because of this brevity, however, certain statements are made without much room for flexibility and exception to the generally accepted rule (and in this unsettled area of plant physiology, there are many). For example, CO_2 is said to be available *only* from the air; no mention is made of CO_2 from respiration or CO_2 pickup as in a reverse Kreb's Cycle. However, a good review is given of recent advances in using isotopes as tracers.

In the opinion of the reviewer, one of the most serious omissions occurs in Chapter 7, on organic constituents of plants (carbohydrates, proteins, fats, enzymes, and miscellaneous compounds, 8 pages!). In general the treatment is what one finds in an organic chemistry or elementary biochemistry text, i.e., merely names, structures, and classification. The author missed a grand opportunity to give to students in the applied fields, who do not normally acquire this material in other courses, much pertinent information on organic compounds and constituents composing plant tissues and organs.

One of the best chapters in the book is the last one, Chapter 9, on growth and movement (21 pages). The examples and explanations are very good and clear. As in most first edition texts, a variety of slight errors will crop up. There is one on page 153, where the author gives the impression that one has to work in darkness in making auxin assays, whereas normal red or orange light is generally used. The diagram in Figs. 8 and 9 is a poor one for demonstrating *Avena* curvature assay (the angle referred to is no angle). The author should consult Went and Thimann's *Photohormones*, p. 31, Fig. 10.

In general, then, the text has much to recommend it and has a definite place in institutions that do not have a major curriculum in plant physiology, as well as in agricultural colleges and other schools of applied science.

A laboratory manual by the author accompanies the text. This 50-page manual follows the text closely from Chapter 3 on. Each of the 49 experiments has many selected journal references and good page references from several texts (Meyer and Anderson are included here).