Surface Science

Physical Chemistry of Surfaces. ARTHUR W. ADAMSON. Interscience (Wiley), New York, ed. 2, 1967. xx + 747 pp., illus. $15.

W. D. Harkins pioneered effectively in the study of surface chemistry, and the University of Chicago became a center for such studies. The second edition of Adamson's *Physical Chemistry of Surfaces* continues that tradition. The book is a text designed for first-year graduate students and for chemists wanting to find their way through the rapidly proliferating literature of surface chemistry. It treats traditional subjects such as capillarity with special attention to the electric effects and to charged films. Solid surfaces are extensively treated, and a discussion of chemisorption and catalysis is included. In a more applied vein we have discussions of friction, lubrication, flotation, and detergency. In the new edition contact angle and nucleation figure more prominently, and the entire volume has been updated to take account of the changes in the seven years between editions. Collections of problems will aid the serious student to measure his own progress in understanding surfaces. The book is written in a very readable style and is recommended to anyone interested in a contemporary overview of surface chemistry.

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Hydrophytes

The Biology of Aquatic Vascular Plants. C. D. SCULTHORPE. St. Martin's, New York, 1967. xviii + 610 pp., illus. $23.

When aquatic vegetation is mentioned, people generally think of algae. Yet in many habitats, especially in freshwater lakes and streams, the majority of the flora consists of vascular plants—mostly flowering plants, but also some ferns or their allies. Some are actually floating, but most have roots, stems, leaves, and flowers or other complicated reproductive systems (as in *Marsilea*). Some are wholly submerged, others bear aerial flowers and leaves. Although the flowering plants evolved largely on land, some have returned to fresh water, or even to the sea—often with very interesting adaptations to the aquatic environment.

Sculthorpe has assembled an excellent book on these little-known plants, including much information about their structure, reproduction, development, physiology, ecology, and geographical distribution. Although emphasizing British habitats, the book also deals with other regions, including America.

The author devotes considerable space to the spread of aquatic weeds, such as *Elodea* and *Eichhornia* (the notorious water hyacinth), and their control, natural or by man. In this connection the book points out that "the notion . . . that aquatic plants are unusually luxuriant and productive, is purely subjective and qualitative; . . . when judged by quantitative criteria, most submerged and floating communities are in fact poorly productive." While the standing crop may appear high, it generally has a large water content, and a floating mat may conceal a paucity of plants below it. Sculthorpe gives an interesting table of standing crops, in which a marine plant *Thalassia* (turtle grass) and the common cattail (*Typha*) display the highest dry weight per unit area, with *Eichhornia* a close second.

The ecology and structural adaptations of aquatic vascular plants are accorded the greatest treatment, with primary emphasis on freshwater habitats. There is not much discussion of bogs, and one misses a special chapter on marine flowering plants, though eelgrass (*Zostera*), turtle grass, and manatee grass are indeed mentioned in many contexts. There is no treatment of mangroves, which are perhaps the most abundant marine flowering plants in the tropics, with fascinating adaptations to their difficult environment. Nor is the bald cypress (*Taxodium*) given any but passing reference. Perhaps trees may be out of the proper scope of the book, despite their submerged roots. Curiously, the most important economic hydrophyte (rice) is accorded only a paragraph, as are the fiber-bearing plants such as rushes and *Zostera*. Ornamental water-gardening is briefly discussed.

However, the book is a most useful compendium of information about hydrophytes, and a welcome addition to the slim list of books (such as Fassett's *Manual of Aquatic Plants*) on these plants. It should serve to introduce many people to a subject generally neglected in other texts, and one increasingly important in these days of concern about the quality of the aquatic environment. This reviewer found it very interesting reading.

The book is well edited and illustrated, and has an extensive bibliography, which serves very conveniently as author index as well.

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Satellite Meteorology

Viewing Weather from Space. E. C. BARRETT. Praeger, New York, 1967. xii + 140 pp., illus. $6. Praeger Monographs in Geography.

This book presents clearly and readably many of the facts relating to the remarkable series of weather satellites which have been launched since 1960. Cameras mounted on these vehicles have revealed many cloud structures not recognized before and have laid the basis for obtaining continuous global atmospheric data. The author, who is a geographer at the University of Bristol, describes the Tiros and Nimbus satellites and discusses their capabilities and methods of analysis. Although this material is nontechnical and very brief, it is instructive and interesting.

Half of the book is devoted to elementary discussions of hurricanes, the general circulation, and other atmospheric features. The author stresses the application of satellite data to these topics, but it is doubtful if material of this complexity should be handled in this qualitative way. In this section the book is marred by numerous generalizations which are seriously misleading.

Any book on weather satellites must be out-of-date before it is published. The ATS synchronous satellites, which have provided continuous views of cloud development and movement since December 1966, are referred to briefly as a future development.

Collection of data by satellites and their use in remote probing of atmospheric distributions of temperature and water vapor are briefly mentioned. These applications appear likely to provide as big a step forward over present satellite capabilities as present satellites do over airplane photography.

The book provides interesting information for the layman who wants to know what meteorologists are about; however, the serious reader should go on to more complete and more accurate sources.

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