Book Reviews

Microbial Ecology. Seventh Symposium of the Society for General Microbiology, held at the Royal Institution, London, April 1957. Published for the Society by Cambridge University Press, New York, 1957. viii + 388 pp. Illus. + plates. $6.50.

The appearance of a new volume in this distinguished series has always been a noteworthy and gratifying event in microbiology. And so, when it was announced that the symposium would tackle microbial ecology, it became apparent to those who have some comprehension of the status of this subject that the challenge was exceptional and that the outcome would have to be extraordinary to maintain the level to which we have been conditioned by the previous six volumes. That the present volume is out of character is therefore not astonishing; in itself this is a commentary upon the previous symposia, upon the make-up of the present symposium, and upon the status of microbial ecology in relation to modern experimental microbiology.

The unique quality of the earlier volumes is the stimulation that always comes when experts mold facts with imagination and project ideas beyond the reach of immediate experimental verification. To be given an opportunity to witness the insights and reflections of authorities who have thought a great deal about the areas of their competencies is a valued privilege we have come to expect of these symposia. This is microbiology at the conceptual level, an all-too-uncommon approach. In *Microbial Ecology* this flavor is substantially less in evidence—in part a consequence of the intrinsic difficulty of coming to grips with the essence of the concept implicit in the title.

However, the chief and fatal weakness of this effort is the assemblage of authors, the majority of whom had no message to deliver. Topics may even be of secondary importance in an affair of this kind so long as the organizers insure that its cardinal function—to unloose a flow of ideas—is fulfilled. The program of the present symposium can perhaps be explained in large part by the availability of the particular participants.

There are, though, some exceptions that are rewarding highlights; for example, F. C. Bawden on plant hosts and G. S. Wilson on aspects of virulence for animals are original, provocative, and scholarly essays after the classic manner. The same holds for the chapter on visible light and microorganisms by R. Y. Stanier and Germaine Cohen-Bazire, carried off with characteristic Stanierian virtuosity. These might well be required reading for graduate students in all branches of microbiology.

The remaining chapters deal, respectively, with the genome, nutrition, hydrogen ion and oxidation-reduction potentials, pressure and temperature, antibiotic production, osmotic pressure, bacteriophagy, predacious fungi, survival of fungi, protozoa, some cellulose-decomposing bacteria, man and animals as hosts, survival and transmission of animal viruses, and arthropod vectors for plant viruses. For the most part these are adequate for the reader seeking a résumé of the current status of the respective topics.

The constitution of "microbial ecology" is a highly subjective matter. Notwithstanding, the essential nature of microbial ecology is grossly misrepresented by the motley assortment of topics here chosen. Moreover, the all-embracing scope has necessarily entailed serious sacrifices. Apart from the strikingly disproportionate emphasis accorded some subjects in relation to others, there is a diffuseness and incohesiveness that derives from a selection of topics that do not lend themselves to integration. This, unfortunately, obscures any central theme and dissipates the impact on the reader, especially on students for whom the previous symposia in this series have been especially instructive and inspiring.

The breadth of subject matter in this volume will be of little consolation to the student and to the average general microbiologist alike, who will be amazed to discover that some of the best-studied habitats of microorganisms, ecologically speaking, such as stagnant ditches and ponds, muds, manure and vegetable matter composts, hot springs, silages, sewage, and the rumen of cattle, are not included.

Difficulties of this kind, and the problem of microbial ecology as a "field" are symptoms of a situation that Charles Dudley Warner had in mind in making the celebrated observation about the weather that is so often attributed to Mark Twain. Microbial ecology has to do with the survival and activities of microorganisms in the exquisitely complex pattern of nature, typically in the context of other microorganisms. Furthermore, the ultimate in microbial ecology is characterized not by environments in nature so extreme as to be unique "ecological niches" but by "normal" conditions where determinant forces are subtle and in dynamic equilibrium. If anything is distinctive about the natural environment of a microorganism, it is the competitive influence of large numbers of other, diverse, microorganisms. In his *Microbiologie du Sol,* Winogradsky's voice was loud and clear in exposing the inadequacies of pure culture methods and laboratory-imposed extremes and the dangers of interpreting microbial phenomena in nature from such information. Yet nowadays, as evidenced by most of the contents of *Microbial Ecology,* these still represent the main approaches to ecological problems. Indeed, it is all too clear that solution of such problems could be furthered greatly if they were approached in the old-fashioned natural history manner *à la* Winogradsky, whereby an accurate description can be obtained of the make-up and the behavior of the mixed populations characteristic of various environments.

This volume, albeit considerably out of focus, has done a service in spotlighting the subject of microbial ecology. We can hope that the embryonic subject of microbial ecology, through the kind of discernment Bawden eloquently reveals on the opening page of his presentation (page 299), will have metamorphosed into a recognizable entity and will be adequately represented when it reappears as the agenda of a symposium of the Society for General Microbiology.

J. W. Foster
Department of Bacteriology, University of Texas, Austin

Sun Circles and Human Hands. The Southeastern Indians—art and industries. Emma Lila Fundaburk and Mary Douglass Fundaburk Foreman, Eds. E. L. Fundaburk, Luverne, Ala., 1957. 232 pp. Illus. $7.50.

This work begins with a competent eight-page summary of the major archeological periods of the southeastern United States, written by Emma Lila Fundaburk. In succeeding chapters are reprinted standard accounts by other authors on various aspects of prehistoric Southeastern art and industries. Each chapter is followed by a set of illustra-

tions, with detailed captions written by Fundaburk or quoted from appropriate technical literature.

The text provides a reliable survey of Southeastern archeology but does not contribute new data or interpretations. The illustrations, however, are exciting even to specialists on the Southeastern Indians. Fundaburk searched for them in a large number of private collections and obscure museums, as well as in the major museums. She found good examples of typical artifacts and many remarkable pieces not previously illustrated or described. The specimens are well identified and scrupulously documented, and the photographs are excellent and clearly reproduced. Perhaps the most remarkable feature of the book is that Fundaburk was entirely unknown to Southeastern archeologists before she began her research for this work. With the appearance of her book she has gained their respect and admiration, not only for the obviously great amount of time and expense it involved but also because of the discernment evident in her interpretations.

A number of audiences will find this book useful. Southeastern archeologists will be particularly pleased with the numerous artifacts described and illustrated for the first time, especially those from Alabama, a state where little serious work in archeology has been done. Amateur archeologists and "Indian relic" collectors will like the large number of illustrations and will learn from the picture captions and the text. Artists and connoisseurs of primitive art now have a good source of Southeastern Indian motifs and designs and a striking demonstration that the prehistoric art of this area often equals better-known styles of primitive art in interest and value in terms of modern Euro-American esthetic tastes. Public and school libraries will find this book to be a reliable and readable addition to their reference works on Indians.

WILLIAM C. STURTEVANT
Smithsonian Institution, Washington, D.C.

Pharmacology in Medicine. A collaborative textbook. Victor A. Drill, Ed. McGraw-Hill, New York, ed. 2, 1958. xi + 1273 pp. $19.50.

This second edition attests the success of multi-authorship in a text on pharmacology. As with internal medicine, the increased scope of the field makes authorship by one or two individuals almost too demanding in comprehensive volumes. In the more than 1200 large pages (the weight of the volume is about five pounds) the burden has been spread among some 85 authors, most of them senior professors of pharmacology. The result is an excellent and detailed coverage of the field.

The type is clear and pleasant; there are two columns to the page for easier reading; and tables, structural formulas, and pertinent references are plentiful. The book will have appeal both to workers in pharmacology and to many others who seek readable presentations in specific areas.

WINDSOR CUTTING
Department of Medical Microbiology, Stanford Medical School, Stanford University

Exploring the Atmosphere's First Mile. vol. I, *Instrumentation and Data Evaluation*; vol. II, *Site Description and Data Tabulation*. Proceedings of the Great Plains Turbulence Field Program, 1 August to 8 September 1953, O'Neill, Nebraska. Heinz H. Lettau and Ben Davidson, Eds. Pergamon Press, New York and London, 1957. xiv + 578 pp. Illus. 2 vols., $20.

In the summer of 1953, meteorologists from ten universities and five government laboratories joined in the Great Plains Turbulence Field Program, the most intensive observing program to which the atmosphere has ever been subjected. An area near O'Neill, Nebraska, was chosen for the program. This area is said to be the flattest site in the flattest state in the flattest region of the United States. Lettau and Davidson, the leaders of the program, have edited this report, which has been written by about thirty-five of the participating scientists. The purpose was to describe the state of the lower part of the atmosphere in sufficient detail to make possible accurate calculations of turbulent transfer of heat, momentum, water vapor, and other gases and pollutants. The ultimate purpose was to achieve an accurate theory of atmospheric turbulence which would provide explicit data on the dependence of evaporation on wind speed, radiation, and the nature of the surface; which would express the warming or cooling of the air in terms of similar factors; which would specify the characteristics of the turbulent motions by the static stability and the configuration of the boundary, and so on.

Volume 1 contains accounts of the synoptic observing program, subsoil measurements, interface measurements, mast profile observations, fluctuation quantities, and free-air observations, plus a general introduction and a summary of some of the results of calculation. Volume 2 contains summaries of the data taken in seven observation periods totaling 171 hours. Additional data are on file at the Geophysical Research Directorate and at the cooperating universities. Many of the participating scientists have been working since 1953 in reducing the data and in applying the results to theory. Testing of theories will be greatly facilitated by publication, and we may expect these volumes to be exploited like a productive gold mine for years.

The most dramatic achievement of the program was the discovery of the low-level jet, a high-speed layer of air that is observed at night at a height of about 500 meters above the ground. This discovery has stimulated wide discussion, and Blackadar and Buajitti have been able to explain the phenomenon as an inertial oscillation resulting from diurnal changes in eddy viscosity.

Another development of great interest was the field testing of the sonic anemometer, applied to the problem of direct measurement of turbulent heat transfer.

The part of the program which lay at the heart of the undertaking—observations of vertical profiles of wind, temperature, and humidity—has been somewhat disappointing. Although observations were made on a much more intensive scale than ever before, the calculations reflect the same stubborn sources of error, and the various independent methods of calculating evaporation and heat transfer do not agree as closely as had been hoped. The profiles of vapor pressure are particularly unreliable.

A second field program, designed to measure directly the diffusion of gas and to relate these measurements to profiles of wind, temperature, and humidity, was carried out during the summer of 1956 at the same location. The report of this program is not yet available.

ROBERT G. FLEAGLE
Department of Meteorology and Climatology, University of Washington

General Diagnosis and Therapy of Skin Diseases. An introduction to dermatology for students and physicians. Hermann Werner Siemens. Translated from the German by Kurt Wiener. University of Chicago Press, Chicago, 1958. vii + 324 pp. Illus. $10.

The author's method of introducing dermatology to students and physicians is as revolutionary as would be the case if modern pedagogy returned to syllabication as an aid in the teaching of spelling, rather than insisting on an initial grasp of each word as a whole. Through the medium of close-up photography Siemens has made a unique presentation of the elements that must be observed and understood in order to diagnose and treat diseases of the skin. Each minute