evinces a certain modernity in that the majority of the papers are written by women. The book is divided into two parts. The first consists of five quite different papers with an editorial comment containing the following summation of their content: "We have been told how a body of fieldwork developed (by VanStone), how fieldwork by cooperating subdisciplines was done (Ackerman), how evidence was interpreted to show tradition in nonmaterial culture rather than the material segment of culture to which archaeologists apply the concept of 'tradition' (Townsend), and how ethnohistoric evidence was interpreted to show a cultural style, in this case a style of local oral history (McClellan)."

The collecting of these papers came about because of a symposium, and some of them were apparently produced by demand. The quality is uneven, as is usual in such cases. James VanStone's methodological perspective is especially deserving of attention, however, and Catharine McClellan's "Indian stories about the first whites in America" represents an approach to the historical tales of preliterate peoples that is novel and should not be missed.

The second and larger part of the volume consists of a study of the social system of the Aleut as it existed from 1750 to 1810 insofar as data can be derived from the early historical sources. "Aleut," as some readers may not remember, is the name of the aboriginal inhabitants of the Alaska Peninsula, which stretches out southwesterly toward Asia for approximately a thousand miles. The tragic history of the Aleut provides one more example of the destruction of an aboriginal people suddenly brought into contact with aliens of superior power bent on material enrichment. Margaret Lantis has analyzed the published sources to provide a long-needed and very readable summary of the social culture of these extraordinary and historically significant native Americans. It is only intended as praise to regret that a comparable summary of the records concerning the material culture and religion of these people could not have been included to provide a complete reconstruction of Aleut ethnography.

CORNELIUS OSGOOD
Peabody Museum,
Yale University,
New Haven, Connecticut

The Question of Additives

Metabolic Aspects of Food Safety. Based on the Second Nuffield Conference, 1969. FRANCIS J. C. ROE, Ed. Academic Press, New York, 1971. xxiv, 612 pp., illus. $22.

Many people have long been concerned with the possible adverse effects on human health of the many substances used for preservation, texture, color, and flavor of processed foods. Color, texture, and flavor may not be nutritionally important, but without some means of food preservation it would be difficult to provide adequate protein, fats, and calories to large populations living in crowded areas and impossible to provide the wide choice of foods found in modern chain stores and supermarkets. At present, more than 2500 substances have been declared reasonably safe as food additions for a variety of purposes; some are derived from basic foodstuffs and some are of synthetic origin.

Suspicion that not all additives may be safe in terms of health has not been confined to food faddists or "health food" addicts. It also occurred to the Food Safety Committee of the Nuffield Foundation, which in 1960, upon deciding that there was a basic need for new and more relevant methods for testing food constituents, additives, and contaminants for toxicity and a need for research workers trained in multiple disciplines to develop such tests, undertook a program to fill those needs.

The proceedings of the Foundation's first food safety conference resulted in an excellent book, *Pathology of Laboratory Rats and Mice* (E. Cotchin and F. J. C. Roe, Eds., Blackwell, 1967), which provided a basis for assessing normal variations in tissues. The present volume contains the proceedings of the second conference. In it, 20 papers are presented and discussed by 48 participants, from universities, government, and industry, of whom 10 came from countries other than Great Britain. Many disciplines are represented, including biochemistry, toxicology, pathology, microbiology, pharmacology, physiology, medicine, and oncology.

There are five chapters on the gastrointestinal tract, two on renal function, four on tumors and carcinogens, and three on the liver. The remainder deal with such aspects of the subject as metabolic pathways, enzyme induction, age, protein metabolism, and organ weights. The problem is carefully and thoughtfully outlined by the late Alastair Frazer, to whom the book is dedicated.

There are a great many useful and interesting data, and one is given much to think about. Some contributors tend to stray a bit from the subject by discussing drugs, pesticides, and known toxicants or by offering rather nonspecific tests which do not distinguish toxicity from disease. The ideas that food additives could react with food adversely, be converted into toxic metabolites, alter or destroy micronutrients, or modify responses to other environmental contaminants or toxicants, such as drugs, are advanced and considered.

In general, food additives as presently tested and used were cleared of suspicion by the participants. As J. M. Barnes put it, "every time any interesting toxic effect was mentioned, the agent concerned was a drug or pesticide and not a food additive." He hopes it will be seen that "food additives do not constitute a very serious toxic hazard because of the way in which they are selected and tested."

This book should be a valuable addition to the libraries of both applied and basic scientists interested in toxicology, in food preservation and processing, or in the possible toxicity of additives. As usual in conferences such as this, more questions are asked than answered.

HENRY A. SCHROEDER
Dartmouth Medical School
Trace Element Laboratory,
Brattleboro, Vermont

Soluble Bacterial Antigens

Microbial Toxins. SAMUEL J. AJL, SOLOMON KADIS, and THOMAS C. MONTIE, Eds. Vols. 1, 2A, and 3, Bacterial Protein Toxins. Vol. 1, xxii, 522 pp., illus., $23. Vol. 2A, xx, 412 pp., illus., $22. Vol. 3, xx, 548 pp., illus., $27. Academic Press, New York, 1970–71.

These three volumes are to be followed by three more volumes, two on bacterial endotoxins and one on algal and fungal toxins. The names of the editors are rotated in the first three volumes, all of which deal with bacterial protein toxins.

To summarize briefly: The list of crystalline protein toxins is enlarging.

Little is known about how most bacterial toxins cause damage to host cells, and in many cases their role in bacterial metabolism is unknown. Advances made in biochemistry in the isolation and purification of proteins during the last three decades have provided tools for the study of microbial protein toxins. In many instances isolation and purification have revealed the existence of more than one toxin. For example, in the case of staphylococcal toxins, there are leukocidins with an F and with an S component, enterotoxins A, B, and C (and possibly D), and alpha and delta toxins.

Purified microbial toxins are antigenic, and serological and immunological tests have been developed for identifying and assaying them. With purified microbial antigens the pharmacologist or toxicologist can study the mode of action of the toxin, the microbial physiologist can determine the role of the toxin in the metabolism of the microorganism producing it, and the geneticist and cell biologist can elucidate the role of the gene and other cellular components in toxin production. Many microbial diseases were not recognized as being caused by toxin, and years elapsed between the discovery of the causative microorganism and the demonstration of toxin. Examples are plague (*Pasteurella pestis*), anthrax (*Bacillus anthracis*), and cholera (*Vibrio cholerae*).

Volume 1 of this work deals with general problems and approaches in the study of bacterial protein toxins. The authors of several chapters in volume 1 call attention to the lack of agreement concerning what constitutes a "toxin," the meaning of the term having been fixed in such a way that it has ceased to be of much practical value. One author suggests that "toxin" be replaced with "soluble bacterial antigen." It was the editors' intent to include in volume 2 a chapter on diphtheria toxin, which has been extensively investigated, and well-understood (with respect to site and mode of action) proteins that are liberated by bacteria. Masahiko Yonedo, who was to prepare this chapter, became ill and could not continue, and to avoid delay in publication the topic is omitted from volume 2A. A supplemental volume, 2B, devoted exclusively to diphtheria toxin and authored by Alwin M. Pappenheimer, Jr., is scheduled to appear in the near future. Volumes 2A and 3 contain a comprehensive description and analysis of what is known about each specific toxin as well as guidelines and directions for future work.

Bacterial protein toxins provide an exciting field of research, and these three volumes can be highly recommended to scientists in microbiology, immunology, biochemistry, pharmacology, and related fields.

GAIL M. DACK
494 Wing Park Boulevard,
Elgin, Illinois

Widely Used Drug

Actions of Alcohol. HENRIK WALLGREN and HERBERT BARRY, III. Elsevier, New York, 1970. In 2 vols. Vol. 1, Biochemical, Physiological and Psychological Aspects. Vol. 2, Chronic and Clinical Aspects. xxviii, 872 pp. $64.

Alcohol is the drug most widely used for nonmedicinal purposes and is the drug associated with the most serious social and economic consequences. These facts have led hundreds of scientists throughout the world to study various aspects of alcohol action in an effort to understand the factors leading to, the consequences of, and methods of reducing excessive consumption of alcohol. The result has been a literature so vast and multilingual that no one investigator has even a superficial acquaintance with it all. A critical analytic review of the scientific literature within a systematic framework has been very badly needed. *Actions of Alcohol* has come closest to filling the gap. The authors, whose respective expertise—Wallgren's being in physiology and biochemistry and Barry's in experimental psychology—represents the diversity of scientific disciplines involved in the study of alcohol use, have reviewed some 3641 sources in seven languages to provide the most detailed, comprehensive, and scholarly review of the literature to date. Effects of alcohol at the subcellular, the cellular, the organ, and the behavioral level are described.

Since many investigators working in this field entered it because of an interest in alcoholism, there is a tendency among them to view alcohol use as unique rather than as a special case of a more general set of drug-related phenomena. That is, rather than inquiring into the variables controlling alcohol self-administration, many investigators have designed their research around experimental models of alcoholism. Wallgren and Barry's review reflects this fundamental deficit in the literature.

When drugs are viewed as maintaining consequences for the behavior that has led to their use, families of experimental questions arise. These questions emerge from research with related behaviors and self-administration of other drugs. Many of these questions have not been asked concerning alcohol and only recently have been investigated as they relate to drugs in general. This difficulty is most apparent in those sections of *Actions of Alcohol* that deal with the behavioral effects of the drug. Little systematic framework within which to approach the behavioral literature dealing with alcohol is provided. This is an opportunity missed. The field needs conceptual guidance. In their concluding recommendations Wallgren and Barry plead for multivariate research at multiple levels of analysis. It is a pity that science seeks solutions in complexity when it lacks a conceptual framework within which to understand even the most basic phenomena.

All things considered, *Actions of Alcohol* is an important book. Its strengths at the biochemical, physiological, and cellular levels outweigh weaknesses in the treatment of behavior. It is a welcome and long overdue addition to the scientific literature.

TRAVIS THOMPSON
RICHARD A. MEISCH
Department of Psychiatry,
University of Minnesota,
Minneapolis

The Chiroptera

Biology of Bats. WILLIAM A. WIMSATT, Ed. Vol. 1, 406 pp. + plates, $25; vol. 2, xvi, 478 pp., illus. $26. Academic Press, New York, 1970.

In 1939, when G. M. Allen published his classic *Bats* (Harvard University Press), bats were little understood, even by biologists. For example, at that time the utilization of ultrasonic vocalizations for echolocation and communication was unknown. The best guess then available as to how bats managed to avoid obstacles in the total darkness of caves was that they were able to detect the echo of vibrations set in motion by the air currents generated by flight.