are known to use this as the main source of food.

Weber's book is a detailed review of Attine biology with good illustrations and it deals with a full range of topics including a key to genera. His account of the cultivated fungi is particularly interesting although they have been difficult to name because fruiting bodies are not normally produced even when grown in cultures away from ants. Each ant garden is a pure culture of one fungus species even though different ant species have different fungi and contaminant spores must be abundant on the leaves when first cut. Weber considers that the culture methods used by the ants including salivary and anal deposits favour the cultivated fungus and "weeding" is of much less importance, but the ants clean themselves and the leaf pieces meticulously so contaminant fungi are probably more rarely introduced than one would expect.

To the ecologist the food chain leading to *Atta* is interesting because, compared with the usual predatory or honeydew feeding ants, a fungus has been substituted for a herbivore. Under the controlled conditions of the ant nests it may be a more efficient food chain and it is certainly effective—ten large *Atta* colonies are said to be equivalent to one cow and some South American governments treat them as a plague. Their excavations and recycling of nutrients, however, are likely to be important for stability of the ecological communities where they are abundant.

Although this may at first sight appear to be a very narrow specialist field, this book should be of general interest and it contains information of relevance to a surprisingly wide range of biological research. A. J. PONTIN

Collected Viruses

Virus Morphology. By C. R. Madeley. Pp. vii+179+77 plates. (Churchill Livingstone: Edinburgh and London, 1972.) £2.50.

THE dimensions of most virus particles make them very amenable to examination by electron microscopy, but the published results do not occur in a form convenient for comparisons to be made. They are distributed over a large number of journals and the considerable variations in the techniques used for microscopy can themselves lead to differences in appearance. The collection of electron micrographs in this book, obtained from specimens prepared in the same way—negatively stained with the same stain—and reproduced to the same scale, thus provides a useful series of immediately comparable images. The book is aimed at students of medical virology and so the seventy-odd viruses shown are from those infecting man, but their structures are typical examples of viruses in general, although there are no counterparts of the rod-shaped and head-and-tail plant and bacterial viruses.

The author provides a glossary of common structural terms although these are sometimes confused in the text—it is difficult, for example, to imagine how a morphological subunit on the surface of a virus can appear as a hole. The presence of symmetry could also be clarified if it were pointed out as being a consequence of the subunit structure rather than the reverse. The unique collection of electron micrographs is, however, the main feature and makes it a useful reference book. J. T. FINCH

Alcoholic Biochemistry

The Biology of Alcoholism. By Benjamin Kissin and Henri Begleiter. Vol. 1: Biochemistry. Pp. xxviii+630. (Plenum: New York and London, 1971.) $36.40.

INFORMATION about many aspects of the biology of alcoholism is available in specialized articles and in reviews. Collections of articles by various authors can, by appropriate and wise selection of titles for the chapters, integrate existing facts and new developments in the subject into a valuable reference volume for the student and research scientist. When, however, some of the contributors to such a book produce reviews on the specific subject selected for them, and others write about their subjects primarily from the aspect of their own field of research, the final product tends to be unbalanced and repetitive. This criticism can be applied to volume 1 on biochemistry and to volume 2 on physiology and behaviour in relation to the *Biology of Alcoholism* by Kissin and Begleiter. The different chapers reflect the characteristics of the individual contributors, often presenting good reviews only of their special fields of research. There is little cross reference between the chapters.

The first chapter in volume 1 by Dr Kalant covers the absorption, distribution, and elimination of alcohol together with a section on its effects on biological membranes in which ion movements and transport phenomena are discussed. In his discussion, similar references are quoted and the same general conclusions are reached as those mentioned by Dr Wallgren in his review on intracerebral respiration and brain function. Dr Von Wartberg presents an up-to-date account of his work on the oxidation of ethanol to acetaldehyde by alcohol dehydrogenase, and then to acetate or its activated form by aldehyde dehydrogenase. In most species, he writes, total *in vivo* oxidation of acetaldehyde is faster than that of alcohol, and there is general agreement that ethanol oxidation by liver alcohol dehydrogenase represents the rate-limiting factor for alcohol removal from the whole organism. In contrast, when one reads the statement by Vitale and Coffey in their discussion of alcohol and vitamin metabolism, "it appears that the principal site of alcohol oxidation is the liver . . . it seems likely that the liver is the limiting factor in these studies upon alcohol oxidation", and their supporting evidence, it becomes apparent that volume 1 is a series of unconnected, but interesting and individually stimulating review articles. In volume 1, Truitt and Walshe present another description on the role of acetaldehyde in the actions of ethanol. They discuss the action of serotonin, just as does Feldstein when describing the effect of ethanol on neurohumoral amine metabolism, and Myers and Veale when discussing the determinants of alcohol preference in animals in volume 2. It is an effort to identify these different aspects of the same subject from the index, and when one has identified them, one frequently finds the same references quoted and the same conclusions reached in different parts of the two volumes.

The first chapter of volume 2, on the effects of alcohol on the neurone, gives an account of the relationship of sodium and potassium ions, and of Mg^{2+} and Ca^{2+}, to ATPase. This is comparable to the accounts in volume 1 which quote similar references; however, the conclusions about the effects of alcohol on membrane permeability are not comparable. The succeeding chapter gives an interesting and valuable review of peripheral nerve and muscle disorders associated with alcoholism. Subsequent reviews deal with consumption of alcohol by different animal species, and the genetic, physiological, environmental and behavioural variables which influence it. In their review, Myers and Veale draw attention to the importance of the element of choice, which should be provided for the animal between the alcohol test solutions in the experimental design, in all investigations of alcohol preference in animals, particularly those including genetic or behavioural factors. This can greatly influence the interpretation of experimental results.

The account of conditioned aversion and behaviour modification for the control of excessive drinking by Vogel-Sprott in volume 2 is concise and clear. It compares very favourably with the descriptions of the alcohol-disulfiram syndrome which are scattered through the two volumes. The clinical features of this, and similar reactions produced