

the teaching of morphology, because typology, used with understanding, is a very effective method of organizing information, and facilitating discussion and comparison of complex biological material. This first volume of what is to be a four-volume treatise does in fact go far to vindicate, by the clarity of the reasoning and presentation, the author's philosophical position.

Two of the nine sections promised are contained in *Die Infloreszenzen: Typologie und Stellung im Aufbau des Vegetationskörpers*. The first, devoted to a general account of flower-bearing systems, introduces a scheme of classification based largely on Eichler. Simple inflorescences, in which the branching consists entirely of the production of lateral flowers, are distinguished from complex, in which partial inflorescences stand in the place of the flowers of simple inflorescences. Dr. Troll maintains that the ground plan of all inflorescences is monopodial, and on this reasoning the cyme cannot be accepted as a simple inflorescence, but as a complex derived (conceptually) from the thyrus by suppression. The section concludes with a discussion of the various forms of fusion and unequal growth which so modify the appearance of many inflorescences. The second section, which initiates the typology of inflorescences, begins with a series of rigorous definitions. The compound inflorescence becomes technically a *Synfloreszenz*, terminating in a *Hauptfloreszenz*, and bearing below *Paracladien*, each terminating in a *Cofloreszenz*. The remainder (some two-thirds) of the book consists of illustrations of the concepts defined, the species concerned representing a wide, but largely herbaceous, range of higher plants.

Die Infloreszenzen is certainly outstanding. It has all the care and penetrating observation that have distinguished Dr. Troll's earlier work, and, within the framework chosen, it is intellectually stimulating and of enviable scholarship. There are abundant drawings and many photographs of a remarkably high standard, on which the artists and printers should also be congratulated. Provided they are interested at all in the growth of higher plants, botanists generally, even those of an entirely empirical temperament, will find an acquaintance with *Die Infloreszenzen* a rewarding experience. P. R. BELL

ELECTRONICS: ADVANCES AND EXPANSION

Advances in Electronics and Electron Physics
Vol. 18. Edited by L. Marton. Pp. x+342. (New York and London: Academic Press, 1963.) 89s. 6d.; 12.50 dollars.

NO detailed definition of 'electronics' would survive long enough to be of more than historical value, and any attempt to set a limit to the subject's coverage would meet much disapproval. But a measure of the price one must pay for a carefree approach to the question "What is electronics?" is given in this volume of the series of reviews of progress made in electronics and electron physics. Five subjects are surveyed, spread over a very wide field; one of them is indisputably electron physics and a second almost emphatically so even though it is largely applications of known principles to new instrumentation. A third subject is electronics as many users of electronic devices understand it. By contrast a fourth might have appeared equally well under other omnibus headings, such as spectroscopy, or the Earth's atmosphere; electron physics has to stretch itself somewhat to encompass it. The fifth, on computer organization, has negligible electronics content to warrant inclusion. Such wide coverage may discourage sale other than to libraries, or may call for publication of the articles separately.

The first article, on the nightglow, is short and is largely a collection of observations. The spectral line due

to atomic oxygen at 5577 Å figures prominently; much speculation persists concerning the conditions applying in the regions of the Earth's atmosphere where the emission originates. The next, and even shorter, article is on computer logical organization. The cost of using modern digital computers has been as much reduced by attention to programming as to design principles and reliability. Among the improvements discussed and illustrated here are time-sharing and real-time multiprogramming, content-addressed memories, multi-level memories and the fixed-plus-variable structures which afford added flexibility.

A longer article then looks at a subject with much history—collisions of low-energy electrons and ions with atoms and molecules. It remains of great interest because of the intrinsic simplicity of the systems being studied. The new data provided by refining old experimental techniques and introducing new methods, such as using the microwave conductivity of a discharge, have made necessary reassessment of the relative importance of the processes responsible for the transfer of energy and charge.

A second long article examines how far the electrical performance of junction transistors and diodes conforms to expectations based on the structures and the physical theories of the effects at work. The objective is very worthy but the author fails at times to prevent the diversity of effects from confusing his approach. Direct current and transient properties receive most attention. Despite several references to work published since 1960, the review reflects much more nearly the position in the late 'fifties.

The final review is of electron emission microscopy, a subject which has received much attention in Europe. It shows promise of competing with or complementing transmission microscopy, though the best resolution obtained so far is only of the order of 100 Å. The three main methods described use photo-emission by ultra-violet irradiation, secondary emission by electron bombardment and secondary emission by ion bombardment. With the second method, the primary beam can scan the specimen, and the intensity of the secondary electrons produced can be synchronously presented on a television tube for easy viewing and photography.

J. R. TILLMAN

BONE AND TOOTH SCIENCE

Bone and Tooth
Edited by H. J. J. Blackwood. (Proceedings of the First Symposium held at Somerville College, Oxford, April 1963.) Pp. xvii+425. (London and New York: Pergamon Press, 1964.) 100s. net.

THE first European Bone and Tooth Symposium was held in Oxford in April 1963. The title of this book and of the Symposium derives from the Bone and Tooth Society, formed in London in 1950 to bring together all those involved in research provoked by an interest in bones, teeth and calcium metabolism.

Many countries and disciplines were represented at the Symposium. As a live pulsating thing it was adjudged a success: this book forms the permanent trace of its existence. Forty short papers and four longer lectures were read. Three of the lectures are now presented in brief summary form. For one of the short papers, only an abstract was available in time for publication. All the contributions are presented in English and there are useful references at the end of most papers. A bibliographical index is included at the end of the book. Since many of the contributors vanished to the four corners of Europe and beyond within minutes of the end of the Symposium, and since a certain amount of opposition to publication of the proceedings was democratically expressed during