recognized by the First International Microbiological Congress, in 1930, by the appointment of the first of a series of International Committees on Bacteriological Nomenclature, which have evolved the structure laid down in the present volume.

These committees and their subcommittees have done a magnificent job and have had the courage and initiative to depart from the Botanical and Zoological codes where it has appeared useful to do so. The resulting Bacteriological Code—although differing in certain respects, such as the definition of subgeneric taxa—has retained very many features of the Botanical and Zoological codes, and the three codes form a closely knit group.

The Bacteriological Code is described in four chapters devoted to general considerations, principles, rules and recommendations, and provisions for modification and amendment. Of these, the third chapter is by far the largest and consists of the rules of nomenclature, together with illustrative examples of their application and notations of their resemblances or differences from the corresponding rules in the Botanical and Zoological codes. The fourth chapter, although a part of the code, is a kind of constitution and by-laws for the International Committee on Bacteriological Nomenclature and its subgroups—a judicial commission and various taxonomic subcommittees. There is also an appendix, which includes a summary of usage in the transliteration of Greek words, a section on alternative spellings, a summary of opinions issued by the committee, and a list of conserved and rejected names.

The stated aim of the efforts of the committee is to provide a fixity of legitimate names, putting the nomenclature of the past in order and also providing a nomenclature for the future. Present nomenclature of bacteria—that inherited from the past—is unquestionably in a less than perfect state, having been derived by application of both botanical and zoological systems and seasoned with personal inspirations. At the same time its reformation results in a certain amount of trauma—that caused by a seeming fluidity, such as the shifting of the glanders bacillus from *Actinobacillus* to *Pfeifferella,* to *Malleomyces,* and back to *Actinobacillus,* and that occasioned by the disappearance of an old, well-established name in favor of a quite unknown name because of the discovery of an obscure note published in an obscure journal many years ago. In my opinion, the inclusion of a "grandfather clause" making legitimate current, generally accepted, nomenclature might have some small advantage.

The provision of a nomenclature for the future raises questions which have little or no precedent. It is now clear, for example, that the etiology of diphtheria is dual in nature in that the toxigenic bacillus is lysogenic, and the genetics of the relationship between the bacillus and the bacterial virus is only now being worked out; one wonders what is to become of the entity *Corynebacterium diphtheriae.*

The expressed views of the committee imply that the viruses are to be regarded as bacteria. The semantic aspect is no doubt of small importance, but the problems of nomenclature are immensely complex because they are inevitably taxonomic in nature. A promising start in this direction has already been made, and it may be anticipated that the committee will eventually be able to put this part of the microbiologist's house in order also.

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Man's World of Sound. John R. Pierce and Edward E. David, Jr. Doubleday, Garden City, N.Y., 1958. 287 pp. Illus. $5.

Acoustics may be one of the older and less popular branches of physics, but it has had its share of exciting developments in the past decade or so. In fact, the science of sound is a good example of a new trend—that of bringing man back into the picture. For several centuries the experimental and theoretical studies of sound have paid more attention to its propagation than to its generation and have usually stopped short of the eardrum. This was necessary as long as the physics of sound transmission was not well understood. But with the advent of the vacuum tube, exact measurement became relatively easy, and we are now in a position to study the broader subject of communication from man to man, of which physical acoustics is but a part.

It is in the fields of psychoacoustics, physiology of speech and hearing, and information theory that the most exciting advances have recently been made, not the least surprising development being that these new, nonphysical findings also are quantitative and amenable to mathematical representation. At present it is easier to predict theoretically the decrease in intelligibility of a lecture caused by the passage of a jet plane overhead than it is to predict, theoretically, the properties of a transistor.

Many of these new developments are reported in popular terms for the first time in *Man's World of Sound.* Here the nonspecialist can see how information theory is beginning to unify branches of physics, physiology, and psychology into a scientific study of man's auditory communication to man. The first third of the book deals with the physics of sound; the second third, with the physiology and psychology of speech and hearing. The final third discusses the newer concepts, such as that of intelligibility and information rate and the recent ideas about how speech may be encoded (that is, written down) automatically and how this code can be artificially transformed again into spoken words. The explanations are lucid; there are graphs but no equations.

One might wish that this book could become as popular as Rachel Carson's *The Sea Around Us.* Certainly the subject of oral communication, in its broadest sense, is as important to us as is the ocean; indeed, in the long run it may be as important as the subject of nuclear fission. But I doubt that *Man's World of Sound* will achieve this sort of popularity, for several reasons. For one thing, the book is somewhat spotty; chapters of clear and interestingly written exposition contrast with pages rather loaded with definitions and bald facts. For another, the authors have avoided those pseudo-philosophical disquisitions on the inner meaning of things which so impress the more influential literary critics. It is also true that sound and speech are a little too commonplace to arouse a sense of wonder without resort to histrionics, which the authors have eschewed.

But these are minor faults (if they are faults at all). They should not deter the nonspecialist reader from learning about new and interesting developments in this important field of science and technology.

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The Scope of Physical Anthropology and Its Place in Academic Studies. A symposium held at the Ciba Foundation, 6 Nov. 1957. D. F. Roberts and J. S. Weiner, Eds. Published for the Society for the Study of Human Biology by the Wenner-Gren Foundation for Anthropological Research, New York, 1958. 66 pp.

The expansion of the scope and the widened interests of physical anthropology are succinctly and shrewdly discussed in this little symposium volume. The Ciba Foundation gathered together ten of Britain's foremost students of human evolution (Le Gros Clark, Penrose, Stevenson, Young, Mourant, Barnicot, J. S. Weiner, Oakley, Tanner, and Zuckerman), who have outlined their conception of the research and teaching obligations of the science. The diversity of research interests examined range from

J. M. Tanner's work on human constitutional variation and morphology to the experimental, laboratory studies of Barnicot on human pigmentation. There is an emphasis on morphological and anatomical studies which is not surprising, since Weiner, Le Gros Clark, and Tanner are the principal contributors within the field of physical anthropology. One welcomes the extended discussion of research in human population genetics and its role in our science, as presented by Penrose, Stevenson, Mourant, and Barnicot. The interests of the latter in laboratory and experimental studies is especially important at this stage in the growth of physical anthropology.

Two significant topics treated in the hortatory parts of the symposium are physical anthropology as a liberal discipline (J. Z. Young) and the design of "dream" curricula (Tanner and Weiner). Cellular biology—something of a fad at the moment—finds a place even here in a discussion of human biology and medicine (Tanner).

I am disappointed that this publication fails to note important new research areas in physical anthropology. The implications of recent discoveries in human biochemical genetics (the haptoglobin alleles, hemoglobin variants, Gm serum groups, beta-globulin alleles, white-cell antigens) for the training of students and the organization of laboratories are neglected. There is little awareness in the formal papers (the discussions are not included in the volume) that our discipline encompasses the genetics and morphology of nonhuman primates.

The symposium is directed particularly to British problems, and some of the proposals are not necessarily relevant outside Great Britain. Despite these reservations, this book ably demonstrates that British physical anthropologists living in the middle of the 20th century also practice 20th-century science.

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Amid Masters of Twentieth Century Medicine. A panorama of persons and pictures. Leonard G. Rowntree. Thomas, Springfield, Ill., 1958. xviii + 684 pp. $11.50.

The subtitle, "A panorama of persons and pictures," expresses fairly well the nature and content of this highly personalized book. The author, a distinguished physician and now emeritus professor, reminisces on men and events from associations developed during an academic career of some 50 years spent largely at Johns Hopkins Medical School and as chief of medicine at the Mayo Clinic. The attempt—apparently inspired by remarks in one of Winston Churchill's books—is to present the medical developments of the past half century from the viewpoint of a participant. In fact, quoting from Churchill, the author has sought to emulate the method employed by Daniel Defoe in his *Memoirs of a Cavalier,* where European military and political events of the first half of the 17th century are chronicled in the personal narrative of the fictitious "Col. Andrew Newport."

However, this method, to be successful, requires a great literary skill, deep critical understanding, and insight, and above all, the approach must be consistent. Unfortunately this work fulfills none of these requirements. At times it is frankly autobiographical, at others it interjects a series of thumbnail sketches of medical scientists—all of which tends to destroy coherency and relegates it to the category of reminiscences. Further, the work would have been greatly improved by good editing to rid it of repetitions, stylistic imperfections, and the large number of minor errors.

This is not to say that the book will not have appeal. A rich experience and wide knowledge of the medical field provides much of merit which is well presented and will interest both lay readers and members of the author's profession.

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The Grafter's Handbook. R. J. Garner. Faber and Faber, London, ed. 2, 1958. 260 pp. 25s.

The second edition of this handbook retains its commendable objective in presenting the amateur or professional horticulturist with a simple, straightforward discussion of the science of grafting. That it has been brought up to date is evidenced by the inclusion of such topics as gibberellic acid, polyethylene, and mist propagation. The discussion of the recent use of such methods in horticulture and of their immediate application to grafting reflects the progressive attitude of the author. The same may be said of Garner's discussion of the various grafting methods used by virologists in indexing plants for the transmission of virus diseases.

The handbook begins with the occurrence of grafting in nature and antiquity. Succeeding chapters take up compatibility and cambial contact, rootstocks and their propagation, the collection and treatment of scion-wood, tools and accessories, methods of grafting, tree-raising in nurseries, and grafting-established trees, and there is a concluding chapter.

The reader is readily able to follow all instructions by means of 149 line drawings and photographs accompanying the text. A listing of 143 references is invaluable to the professional desiring more detailed information. Many English terms foreign to our horticultural language are defined in the glossary.

The recommended combinations of rootstock and scions cover only pears and plums in the three appendices. This section could be expanded to include other fruits and some of the commonly grafted ornamental woody plants. Information of this type would aid nurserymen in producing compatibly grafted plants of desired habit or vigor.

Garner is to be commended for his clear exposition of the subject-matter of this volume, which documents his 30 years' experience at the East Malling Research Station.

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The Physical Foundation of Biology. An analytical study. Walter M. Elsasser. Pergamon Press, New York and London, 1958. x + 219 pp. Illus. $4.75.

The scientific ideals and, to an important extent, the working structure of biology are governed by established tenets concerning its relations to physics. In this system of faith, physics is the paradigm of what is scientific; and biology at its contemporary best is a rather messy but hopeful kind of physics, the resultant of an inconvenient number of variables and the preoccupation of the better minds with the cleaner aspects of nature. Biologists may feel a bit uneasy about this, especially when they are reflecting upon important biological insights which owe little to physics and which may, as in the case of the evolutionary concepts, have had a considerable impact upon the physical sciences. But, as the cracker-barrel philosophy of biology has developed in the hands of biologists, it has seemed that the alternative would be vitalism, which has been demonstrably sterile.

So pretentious are the titles of books, that many readers encountering Walter Elsasser's *Physical Foundations of Biology* would probably expect to find still another tract on physical pie in the biological sky. This book, by a professor of theoretical physics at the University of California at La Jolla, contains more than the title promises, for it is not merely a highly critical examination of the question "can physics explain biology?" but also a reexamination of the foundations of physics in the light of those potentialities of the physical world that are realized in biological systems.