ganic diversity and stability they have lost."

It will require time for this real contribution to be "discovered" and removed from the literature of geography to its proper position in the botanical and ecological literature of the Caribbean, because it is published in the University of California Publications in Geography.

RICHARD A. HOWARD
Arnold Arboretum,
Harvard University

Handbook of Physiology

Respiration (Williams and Wilkins, Baltimore, Md., 1965. 778 pp., $28), volume 2 of section 3 of the American Physiological Society's **Handbook of Physiology**, is perhaps less organized than is desirable from the reader's standpoint, but to integrate the various facets of the more applied subjects would have delayed publication of these résumés and thus must be relegated to some future synthesist. Although several chapters in which the contribution is essentially a presentation of "concepts" of our knowledge might more properly have been included in volume 1, that already lengthy volume (900 odd pages) would thereby have become even more unwieldy. Thus the juxtaposition of applied research and more closely related concepts was carried into the 778 pages of volume 2.

There are 39 chapers, of which one is subdivided into distinct parts that constitute several more treatises, each with its own list of references. As the editors point out, the literature references are highly selective and thus represent only illustrative bases for the support of fundamental concepts, but by-and-large they also present the most sophisticated work in the field, and they are cited for continued reading as well. Approximately 4000 references are cited, although it must be assumed that many refer to the same paper or review.

The 39 chapters of this volume were contributed by 42 authors; six chapters have dual authorship, while three authors undertook two chapters each. In general the authors are recognized major contributors to the field, and it is important to note that an international representation has thus resulted, drawing from young and old where most appropriate. The contributors are Erling Asmussen, John E. Affeldt, J. Howland Auchincloss, Jr., Albert R. Behnke, Jr., William A. Briscoe, D. V. Bates, John Butler, Margaret R. Becklake, Hans G. Clamann, K. W. Cross, R. M. Cherniack, John A. Clements, Helen Conrad Davies, R. E. Davies, G. S. Dawes, Arthur B. DuBois, James O. Elam, Robert E. Forster, David G. Greene, Edward A. Gaensler, Robert E. Hyatt, Max Kleiber, T. W. Lamb, Christian J. Lambertsen, Ulrich C. Luft, Edward H. Lanphier, C. P. Larson, Jr., John C. Mithoefer, Robert Marshall, M. B. McIlroy, Johannes Piiper, S. Permutt, W. S. Root, R. L. Riley, D. W. Richards, H. E. Stokinger, J. W. Severinghaus, J. A. Schilling, S. M. Tenney, D. F. Tierney, J. B. West, and G. W. Wright.

The volume is roughly separated into three units: the first 18 chapters being devoted to evaluation of the effects of environment, including the fetal, and dealing with basic concepts; the next ten dealing with principles of methodology regarding measurement of pulmonary function and constitute critiques rather than expositions (although they are specific enough in the jargon of the field to be well worth studying by newcomers to the discipline); the third group (11 chapters) comprising clinical aspects of pulmonary function viewed in the light of these multifarious concepts.

It must be pointed out that this whole presentation summarizes a honing of traditional methods of study and analysis of pulmonary physiology, which has engaged the postwar generation of physiologists, partly through the stimulus of the many questions developed during that hectic period in which adaptation to, and protection from, hostile environments became a national necessity. It was, of course, made possible by the phenomenal advances in measurement techniques and ultrasensitive devices for the measurement of nearly all parameters previously only crudely appraisable. A few new concepts, such as surface effects and those of inert gases, have been rediscovered, but to date analyses of these concepts, are hardly comparable to those of the more traditional ventilatory and circulatory measurements. Despite the tremendous refinements in technique and reliability, application of the gamut of measurements is still on a statistical basis and the concept of specific ability for gas transfer is still a three-factor term of which functional area and thickness are as yet inseparable. It is also apparent that anatomists and pathologists are about the only ones who have acknowledged the function of the lymphatic system in the lung.

Inasmuch as the volume is not a compendium of research in the field (although some 14 chapters have extensive reference sections), the absence of an author index may be justified. The index would, however, have aided the teaching functions alluded to on the dust jacket.

This volume with its companion and the other parts of the *Handbook* will certainly be a practical guide to the field for some years to come. Although few students can afford to have copies of the *Handbook* on their desks, school and laboratory libraries should make it freely available to "students, young and old—who need to increase their understanding and sophistication to a level adequate for predoctoral study, for teaching, and for preliminary orientation in preparation for research."

HEINZ SPECHT
National Institutes of Health,
Bethesda, Maryland

Fluorine Chemistry

Kaj Roholm's monograph *Fluorine Intoxication* (1937) has long been a classic in its field, and we have a volume dedicated to the memory of Roholm (1902–1948)—**Fluorine Chemistry**, vol. 4 (Academic Press, New York, 1965. 804 pp., $28), by Harold C. Hodge and Frank A. Smith.

The book contains two chapters: "Biological properties of inorganic fluorides" (375 pp.) and "Effects of fluorides on bones and teeth" (306 pp.). The material in each chapter is arranged under main subject headings, most of which also contain subheadings. Appended to each chapter is a list of supplementary reference material, 11 pages for chapter 1 and 9 pages for chapter 2. Listed under pertinent titles are names of authors whose papers are not cited in the chapter, with dates of publication, so that the citation can be found in the full bibliography. Papers are cited by name of the authors, and by the use of "*et al.*" and date of publication in the text but with the names of all authors and the first and last pages of the paper in the bibliography. Titles of the papers are omitted. It is stated that "The complete bibliography with titles upon which this volume is based has been deposited as

Document Number 8452 with the ADI Publications Project, Photoduplication Service, Library of Congress, Washington 25, D.C. For photoprints or microfilm copies address inquiries to: Chief, Photoduplication Service, Library of Congress. Kindly cite document number" (p. xi).

The bibliography presented by Hodge and Smith supplements that of Roholm, although some papers published prior to 1937 are cited. Some of these entries are also cited in Roholm's book but most of them are not. That few of the citations were published after 1960 suggests that the editor and the authors should make immediate plans to provide detailed coverage of the material published after that date. The 8-page subject index covers both chapters.

Generally the authors have done most of the writing. "Effects of fluorides on enzyme systems" (p. 176) is done briefly by relying on a review published by Borie in 1945. The section "Histogenesis and mechanisms in the development of osterofluorosis" (pp. 424 to 441) was written by Lent C. Johnson.

Tabulated material, including a few brief tables not assigned numbers, fills approximately 455 pages. A list of the titles of the tables is provided (pp. xv to xviii). Some of the more than 80 figures present several aspects of the subject matter.

The following quotation is from the preface by the editor, J. H. Simons: "An extensive survey and discussion of a vast amount of research on the physiological properties of fluoride ion and of substances capable of producing it in aqueous solution are given in this volume of 'Fluorine Chemistry.' These vary from the detrimental effects of excessive fluoride ingestion, through the beneficial effects of optimal amounts, to recognized detrimental effects, i.e., the greater incidence of dental caries accompanying suboptimal fluoride intake. Fluoride metabolism is discussed fully, e.g., the capacity for storage of fluoride by the bones and the rates of excretion of fluoride from the body. Of particular importance is the relation of fluoride ion to the health of teeth and bones: this volume reviews a good deal of careful research on this problem."

Generally the sections are followed by concise, conclusive summaries stated in such a way that "lifting them from context" will be difficult.

GERALD J. COX
School of Dentistry,
University of Pittsburgh

Laboratory Methods in Clinical Virology

The British have been major participants in the exuberant growth of virology during the past generation, and this little book, **Diagnostic Methods in Clinical Virology** (Davis, Philadelphia, 1966. 139 pp. Illus. $5), by N. R. Grist, Constance A. C. Ross, Eleanor J. Bell, and E. J. Stott, is evidence of their excellence in the practical field of laboratory diagnosis as well. The book is concise, explicit, and well organized. Although the only methods presented are those used in the Regional Laboratory in Glasgow and alternatives are not given, the selection is a good one, and laboratory workers familiar with the basic principles will doubtless find it very useful indeed.

The laboratory identification of virus infections has never reached the stage of practical value that bacteriologic diagnosis has attained. It is more cumbersome and slower. Thorough testing remains a large undertaking, and mixed infections are more difficult to identify than bacterial infections. But there is less need to identify the responsible virus, because there is little to offer in the way of specific treatment. The greatest value of the kind of procedures described in this book has come from the study of outbreaks and through better understanding of the diseases. Fortunately, good clinicians rarely need the laboratory, and, on more than one occasion, clinical findings have been more reliable than laboratory tests. Joint observations, made in hospitals by virologists and practitioners, and intensive study of particular patients may well be most rewarding, and this little manual should encourage clinical pathologists to undertake more laboratory testing. By so doing it would provide new opportunities to further define the manifestations of virus infections and the value of laboratory tests.

GILBERT DALLDORF
Walker Laboratory, Sloan-Kettering Institute, Rye, New York

Quaternary Deposits in the U.S.S.R.

Atlas and Keys of Fruits and Seeds Occurring in the Quaternary Deposits of the U.S.S.R. (Nauka, Moscow, Russia, 1965. 366 pp.), by N. Ja. Katz, S. V. Katz, and M. G. Kipiani, a manual in the Russian language with an English summary, will be of interest to all contemporary students of Pleistocene and Holocene deposits in North America. Because manuals of this caliber are needed, it forms an outstanding contribution to the existing illustrative literature on determination of Quaternary fossils.

The book provides recommendations for the collection of samples for carpological analysis, methodics of paleocarpological analysis, and methods for determining the age of floras as well as the age and genesis of the deposits containing them. Brief characteristics of carpological floras are given for different periods of the Quaternary for the U.S.S.R. and adjacent territories.

The keys, which are easy to follow, include 108 families and more than 1100 species. Two types of keys are given—a morphological key and a taxonomic one. Diagnostic features of fruits and seeds are given together with data on their present geographical affinity with each taxon. One table is devoted to line drawings of oögonia of Charophyceae, and spores of Salviniaceae, Marsileaceae, Isoëtaceae, and Selaginellaceae. Locations of fossil discoveries are listed following literature data from the U.S.S.R., Poland, Germany, and England, and findings made by the authors are included.

The authors are to be highly commended for their thoroughness and technical knowledge in preparing this manual and for the excellent line drawings of recent comparative fruits and seeds; in many cases they have provided actual drawings or photographs of fossil material. The various faces, cross sections, and detailed cell structures of fruits and seeds are well reproduced and greatly facilitate determinations of fossil material. Dimensions and magnifications are incorporated in legends or descriptions.

Although the manual deals chiefly with Russian and to some extent with European Quaternary deposits, I feel that it can be of great value to workers in Quaternary research in North America. The English summary will be useful to those who are not familiar with the Russian language. The book is attractively bound in a sturdy cover.

I recommend this manual to workers