vation and testing. Administrative devices—including grouping, acceleration, and enrichment—are described, and examples of each are given.

Educators will probably be most interested in the three chapters that describe curriculum and methods for teaching the gifted; programs in mathematics, in language, arts, and social studies, and in science are included. Discussion of vocational guidance and of the role of parents rounds off the educational topics.

Sprinkled throughout the book are chapters dealing with the psychological aspects of giftedness. Freehill differentiates among the terms *genius, talent,* and *giftedness,* although he makes little attempt to define gifted children, except by example. Intelligence is analyzed, and its growth and development are considered. Problems of learning and teaching such as motivation, transfer, evaluation, and structuring are discussed. In the final chapter the author discusses the development of emotions and character. In view of his interest in the psychology of gifted children, it is surprising that Freehill devotes only a few pages to the discussion of underachievement.

The book is a good one for in-service educational courses for teachers as well as for graduate teacher education courses in the education of the gifted.

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Polymer Chemistry

Preparative Methods of Polymer Chemistry. Wayne R. Sorenson and Tod W. Campbell. Interscience, New York, 1961. viii + 337 pp. Illus. $10.50.

Preparative Methods of Polymer Chemistry deals with the details of polymerization of a very wide variety of important polymers and gives practical and detailed procedures for the synthesis and for the handling of these polymers. The preparations are the sort that could be accomplished in any well-equipped organic laboratory. In many cases the authors checked out the syntheses.

I feel that this will be a most useful book to a great number of chemists and that it fills a very definite need.

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Atomic Constants

The Fundamental Atomic Constants. J. H. Sanders. Oxford University Press, New York, 1961. 88 pp. Illus. $1.60.

One of the types of information hardest to find in a concise and readable form is recent experiments on fundamental constants in physics. Although many of the handbooks which are published from time to time give the latest values of fundamental physical constants, the values are usually presented in lists or tables; thus, it is impossible to come to any valid conclusion regarding the relative merits of various experimental values. It is, therefore, very good to find a small book devoting its pages exclusively to the problem of measurements of *e, h, m, N,* and *c.*

A teacher lecturing in modern physics always likes to have on hand information about the various ways in which the fundamental constants are measured and about their interrelations. Sanders' book is written in a way that makes the job of the physics teacher very easy and gives him enough background information so that he can present a consistent picture of experimental methods in determining acceptable values for the fundamental constants. In this the author has done a real service: he has discussed the newest methods in considerable detail, compared them with the older methods, and still kept his whole contribution to less than 100 pages. I am sure it would have been much easier to write a much longer treatise, but Sanders has accomplished the difficult job of presenting this material in a clear and brief fashion. It is certainly a book I would recommend not only to the teachers of physics but also to graduate and undergraduate students who need a source of ready reference to the precision of the constants which they must use.

The book is divided essentially into three parts: The early measurements of these constants, considerable detail on measurements of the velocity of light, and finally recent precise measurements and derivations of the best values. This arrangement is well thought out for the useful role which this small book will enjoy.

For the research scientist, the author has produced a very carefully indexed bibliography, so that the details on any particular measurement can be followed through the literature without difficulty. This is an essential part, since the book is a short review and since the detailed methods of treating the experimental data and of making the appropriate corrections have not been included. On the other hand, these details, which are of interest primarily to those trying to arrive at their own conclusions as to the best values can be located easily in the appropriate sources.

This small book is a welcome addition to the trend of producing monographs on specific subjects, designed to reduce the labor in finding one's way through the ever-increasing jungle of periodical literature.

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Bacterial Genes and Viruses

Papers on Bacterial Genetics. Edward A. Adelberg. Little, Brown, Boston, Mass., 1960. xlvi + 400 pp. Illus. Paper, $4.50.

Papers on Bacterial Viruses. Gunther S. Stent. Little, Brown, Boston, Mass., 1960. xxx + 365 pp. Illus. Paper, $4.50.

Milestones in Microbiology. Translated and edited by Thomas D. Brock. Prentice-Hall, Englewood Cliffs, N.J., 1961. xii + 275 pp. Paper, $3.95.

Joshua Lederberg's compilation entitled *Papers in Microbial Genetics, Bacteria and Bacterial Viruses* (1951) appeared on the eve of great discoveries which materially increased our understanding of the fields covered. Edward Adelberg and Gunther Stent, two University of California scientists, have now selected additional papers and present them in two volumes. Adelberg's collection includes 27 articles; Stent's 25. Each volume begins with an editorial review and a bibliography: bacterial genetics, 177 titles; bacterial viruses, 164. The introductions themselves are valuable orienting, critical, and comprehensive reviews. "No apologies need be offered for a selection which must be largely arbitrary." Originally designed to aid students, the collections will prove of value to investigators and professors. All articles selected are presented in English and all tables, graphs, illustrations, and article bibliographies are included.

Different is the selection of historically important papers included in *Milestones in Microbiology* by Thomas D. Brock (Indiana University). Here,

again, is a paperback prepared for students but valuable to more advanced microbiologists. How many of us have read the 1898 report of Loeffler and Frosch on foot-and-mouth disease? *Milestones* begins with Fracastoro (1546) and ends with Woods (1940) on *p*-aminobenzoic acid and sulfanilamide action. There are six headings: "Spontaneous generation and fermentation" (covering the years 1677–1897, 16 articles); "Germ theory of disease" (1546–1882, 11); "Immunology" (1798–1895, 7); "Virology" (1898–1935, 4); "Chemotherapy" (1897–1940, 5) and "General microbiology" (1875–1924, 12). All selections are in English, but five also appear in an appendix in French. Bibliographies are omitted, and some condensation has been effected—"most nineteenth century workers were verbose."

If professors use these volumes wisely, they will be valuable teaching adjuncts, but scientific literature and history are continually being made. The papers presented should be added to, and inclusions and exclusions should be debated. Last, in view of professional tradition, one can be critical of the presentation of all of these articles in English.

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Paleocene Flora

The Lower Tertiary Floras of Southern England. I. *Palaeocene Floras, London Clay Flora* (supplement). Text and atlas (2 vols.). M. E. J. Chandler. British Museum (Natural History), London, 1961. xi + 354 pp. Atlas, 34 plates. £10.

In 1933 E. M. Reid and M. E. J. Chandler published a 550-page monograph describing some 250 species of fossil fruits and seeds collected from "the stiff brown clay" found chiefly on the shore of the island of Sheppey on the north coast of Kent, southeast England, near the mouth of the Thames. This monograph climaxed a more than 250-year interest in the London Clay fossils, an interest that commenced with the sharks' teeth mentioned in the diary of John Evelyn in 1668.

Reid and Chandler's brilliant contribution unfolded a dramatic story of altered geography and shifting limits of land and sea for northwest Europe and of an evergreen, tropical rain forest, of present Indo-Malayan affinities, thriving in southern England and continuously along the north shore of the warm-current, ancient Tethys Sea that connected, through the Mediterranean, with the Indian Ocean.

Chandler's new monograph is in large part a supplement to the London Clay flora, and it is the first of a comprehensive series that will be devoted to early Tertiary plants of southern England. It considers mainly the "angiosperm fruits and seeds of the Palaeocene floras (pre-London Clay) and . . . those of the London Clay not previously described." Leaves are generally disregarded unless related fruits are known. Wood, pollen, spores, and diatoms are reserved for later papers.

The monograph is based on specimens laboriously collected from fresh and reworked exposures from six principal Paleocene and Lower Eocene horizons in the London and Hampshire basins. The fortuitous conditions which permitted the accumulation and preservation of such an enormous number of fruits and seeds is remarkable. More remarkable is the fact that the 500 species now known are probably only a small proportion of the plants "present in life" in England in the early Tertiary. The feat of recovering so many specimens and species is further impressive since most of the outcrops erode rapidly and many of the remains themselves quickly decompose once exposed.

The main body of the work (286 pages) contains records or detailed systematic descriptions of some 500 species, distributed in more than 140 genera and about 62 families. Nine families and 29 genera are not previously recorded in the London Clay flora. Many of the genera are form genera, or they are extinct. Others are identified as living genera or are considered closely related to living genera. The specimens are described with a thoroughness and competence that characterizes the London Clay monograph, and they are beautifully illustrated in an accompanying atlas in 34 photographic plates and by 54 diagramatic drawings in the text.

The systematic portion is prefaced by a briefer introduction (51 pages). The general scope is indicated by a partial listing of topics: mode of occurrence of fossils and collecting methods, physiographic background and geological records of the Poltavian flora (tropical flora of Indo-Malayan type), conditions of deposition and character of the successive beds, recent work on phytogeographic relations of London Clay flora and climate. A table (pages 8–9) shows correlation of early Tertiary beds of the Hampshire and London basins and relates them to the continental stages of Wrigley and Davis (1937) and Arkell (1947). A map (page 10) shows Eocene physiography of southeast England; the present limit of Eocene rocks; the Eocene limits of fluviatile, estuarine, and marine sediments; and the minimum extent of the Lower Eocene (Ypresian) Sea. Named Paleocene and Eocene species are listed with localities on pages 21 and 24 and 39 to 48.

As a supplement, the present volume is not disappointing in comparison with the London Clay monograph, although it is mainly descriptive. It is to the credit of Reid and Chandler that recent botanical knowledge of the tropical rain forests of the southeast Asian areas and the addition to the fossil flora of several elements, including the Rhizophoraceae (mangroves), has strengthened the similarity between the Indo-Malayan and London Clay flora and mainly confirmed their interpretation of the early Eocene paleoecology of Southern England. Their views concerning the nature of pre-London Clay floras in northwestern Europe are, however, modified. Reid and Chandler believed the antecedent Cretaceous and earlier Tertiary floras of that area to be of a much cooler type than characterized the early Eocene, and "direct migration of the London Clay flora from Indo-Malaya itself along the northern shores of the Tethys was explicitly stated. . . ." As the result of recent paleobotanical work in England and elsewhere, Chandler now thinks that a Poltavian type flora occupied the entire area bordering the Tethys, and recolonized newly exposed land surfaces in northwest Europe following regression of the Upper Cretaceous sea. She shows that the pre-London Clay floras of Britian contained definite tropical forms; some were among the more characteristic or common elements of the London Clay flora.

If other papers in this series are of the caliber of this present volume, they will be worthy additions to paleobotanical literature.

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