the stratigraphic position of the formation. It is believed to be Lower Eocene. The Upper Scotland formation, which is subdivided into three members, contains a relatively rich fauna of larger Foraminifera and corals. Unfortunately, most of the latter represent new species, and the age of the Upper Scotland formation must be based on the general aspect of the fauna. The occurrence of *Pseudophragmina perpusilla* (Vaughan) and *Endopachys maclurii* (Lea) in this fauna, however, is a rather definite indication of the Middle Eocene age of the Upper Scotland formation.

In the systematic descriptions of the forms from Barbados, Vaughan describes a new genus *Orbitolinoides*, which resembles *Orbitolina* but lacks the peripheral zone crossed by radiating plates which is characteristic of the latter genus. Voluminous notes are given on the genus *Miscellanea*, and the various species of the Discocyclinidae are described and figured in great detail. A pustulate species of *Amphistegina*, related to *A. lopeztrigoi* Palmer from the Middle Eocene of Cuba, is described by Cushman in this section of the memoir. The description of a new species of *Polylepidina* and unnamed *Pliolepidina* concludes the section on the fauna from Barbados.

The second section will be of tremendous value to all students of the Foraminifera, since it represents a monographic treatment of the American Discocyclinidae. The discussion of the various species is preceded by an elaborate account of the structure of the test. Vaughan demonstrates by means of microtome thin sections, prepared by Dr. E. H. Myers from specially treated specimens, that one species of *Discocyclina* has annular intramural and radial intraseptal canals, confirming previously held opinions that the Discocyclinidae should be separated from the Orbitoididae and Miogypsinidae.

The classification adopted by Vaughan is essentially the one given by Vaughan and Cole in Cushman's textbook on the Foraminifera, with the addition of the subgenus *Asterophragmina* proposed by Rao in 1942. In the review of American species Vaughan proposes six new species and two new varieties and gives notes or detailed descriptions for forty-six previously described species and three varieties. The systematic portion of the second section would have been more valuable if a complete synonymy had been given in each case.

The second section is concluded by the stratigraphic zonation and geographic distribution of the American species of Discocyclinidae as well as a table in which the locations of the type specimens are given. The illustrations are excellent. Special notice should be given to the many perfect thin sections, because, if these are inadequate, it is impossible to obtain satisfactory photographs and delineation of diagnostic structures.

The final section, by Wells, describes the scleractinian coral fauna of the Upper Scotland formation, in which twenty-seven species and varieties were discovered. Although most of the species and two of the genera are new, the general aspect of the coral fauna is that of the Middle Eocene Claiborne coral fauna of the United States and not similar to other known West Indian Eocene coral assemblages. The fauna suggests that the forms lived in a tropical, nonlittoral environment at depths beyond the lower limits of temperature for vigorous reef growth. Of the two corals described from the Miocene of Martinique, one was known previously from a single Dominican specimen, and the other, a new species, is referred to the subgenus *Eusthenotrochus* previously recorded from the Eocene of the Paris Basin and the recent seas.

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***Introduction to organic chemistry.*** **(6th ed.) Alexander Lowy, Benjamin Harrow, and Percy M. Apfelbaum. New York: John Wiley & Sons, 1945. Pp. xiv + 448. $3.50.**

The sixth, revised edition of this textbook incorporates changes from the preceding edition which represent a steady evolution to keep the book up to date rather than a sudden change. The book therefore retains its essential qualities—clearness, simplicity, and logic of presentation—and avoids the pitfall of numerous other texts which, in their recent revisions, have tried to cover too much and have become unsatisfactory hybrids between elementary textbooks and advanced treatises.

Here we have, as the title claims, a true introduction to organic chemistry. It uses some electronic notations discreetly. The reviewer has quarrels of only minor importance with the authors. Although recognizing that the book seldom explains a topic in terms of something that follows, he finds the paraffins, prepared from acids, and the olefins, prepared from alcohols, in chapters where the students have not yet learned oxygenated functions. It seems more logical to teach that alcohols are hydrated olefins than that olefins are dehydrated alcohols. The description of recent industrial achievement is seldom permitted to distort the general knowledge, yet the description of the nitroparaffins is misplaced, because it destroys the notion of paraffinic sluggishness which it is essential for the student to grasp. The same criticism applies to rearrangement on aluminum chloride, which confuses the student when it is brought up too soon. These topics could easily be displaced into a separate chapter in which it could be emphasized that such reactions become preponderant because of the drastically different operating conditions. The reviewer would also like to see the Wurtz reaction emphasized as one of theoretical, more than practical, interest, since he finds that students are unusually prone to propose any number of condensations using this apparently obvious procedure.

The book is well presented and makes a distinctly better impression than its preceding edition.

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***Introduction to industrial chemistry.*** **W. T. Frier and Albert C. Holler. New York: McGraw-Hill, 1945. Pp. xiv + 368. $3.00.**

This book, written for the benefit of industrial employees taking night-school work, covers a number of independent, apparently hand-picked topics, as shown by the Table of Contents: atoms; molecules and valence; plus and minus valence; radicals and acids; acids, bases, and

salts; energy relations in chemical reactions, reduction and oxidations; production of iron and steel; slags and high-temperature chemistry; aluminum; magnesium; other applications of electrochemistry; the manufacture of chemicals; silicates, glass, and colloids; ceramic and cement; industrial water; fuels and combustion, organic chemistry (theory); plastics; rubber; and the refining of petroleum.

A first reading gives at once the impression that the authors are in earnest and are trying their best in the interest of their students, for whom they obviously feel a warm sympathy. It may be that this is the type of semiscientific information which is best suited for the purpose. The reviewer feels, however, that it is preferable to present the subject in the frankly untechnical manner of writing for the intelligent layman to be found in the *New York Times*, for example. The present method uses repeatedly oversimplified information, which is quite all right, but includes chemical terminology in sufficient quantity to disguise this fact, and the reviewer feels that this may give the students the impression that they know more, or understand more, than they actually do. The reviewer also looks askance at the kind of similes introducing Chapter II, which liken the desire of the atoms to live together in molecules to the fact that a man will be attracted by the earth if he walks off a roof, or to the difficulty of pulling apart two surfaces of polished metal. Since the book is to be used by novices, it would be well to use pictures of molecular models made of colored balls and pegs. The Hirschfelder models are admittedly more correct, but they do not speak to the imagination of the uninitiated.

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***Physics of the twentieth century.*** **Pascual Jordan. (Translated by Eleanor Oshry.) New York: Philosophical Library, 1944. Pp. xii + 185.**

Those interested in the philosophy of science, whether they be professional scientists, philosophers, or intelligent laymen, will welcome this discussion of the epistemology of modern physics. Well written in nontechnical terms and apparently excellently translated (though the reviewer has not had access to the original) the book discusses first the assumptions of classical physics, followed by a lucid treatment of the simpler facts of modern physics and the revision in methodology which these facts, particularly quantum and wave mechanics, have made necessary.

The author, like some others, prefers the positivistic approach to the problems involved in attaining scientific knowledge. He considers metaphysical speculation concerning the *essence* of physical reality as unprofitable and dangerous to science, thus limiting the "philosophy of science" to a consideration of scientific epistemology or ways of knowing. "Up to our time," he writes, "the opinion has remained that it is the task of philosophy to clarify certain 'final' and most general questions of natural science; questions which concern perhaps the 'existence' of matter or the 'existence' of time and space or the 'existence' of force or the 'final' bases of 'ex-