

upon or are treated in most cursory fashion—for example, the complex problem of social stratification.

Any attempt to cover so wide a scope must yield uneven results. In this particular case the impact of a fresh and original conceptual approach appears weakened by the explicit aim to produce a book that can serve as a textbook for basic social science courses in business and engineering colleges. This has led to the inclusion of conventional descriptive materials that add little to the analysis. It also accounts for the very detailed explanation of each conceptual model, which has its didactic values but unduly lengthens the volume. However, these shortcomings detract little from the great merits of this pioneering effort. This book certainly contains proof that it is now possible to encompass a very wide range of social behavior within a rather sparse but tight conceptual scheme. And, while this does require a partly new terminology, the language employed is not unduly cumbersome. The author's major claim that a meaningful analysis of society can be carried out with a limited number of concepts which cut across conventional disciplinary boundaries seems successfully established. As Kuhn himself points out, his analysis represents merely a first approximation. His conceptual framework needs to be tested, modified, and improved by specialists in the various social science disciplines. But even as it now stands, Kuhn's approach opens up new vistas in social science.

Polymer Chemistry

The Chemistry of Cationic Polymerization. P. H. Plesch, Ed. Pergamon, London, 1963; Macmillan, New York, 1964. xvi + 728 pp. Illus. \$30.

The Chemistry of Cationic Polymerization is a competent, up-to-date (to about 1962), critical review of the status of cationic polymerizations and of a number of related subjects. Plesch, one of the pioneers in the field and still one of its most prolific authors, organized, edited, and extensively contributed to this volume.

The book is a compilation of 18 individual chapters, on various selected subjects. Written by distinguished authors. The first two chapters are well

documented treatises that introduce some of the fundamentals of carbonium ions and cationic reactions in general. The third chapter compares free radical, anionic, and cationic polymerization mechanisms and includes a useful subsection entitled "Diagnosis of reaction mechanisms." The next five chapters deal with the cationic polymerization of hydrocarbons and cover isobutene, other aliphatic mono-olefins, styrene, other aryl olefins, and polyenes. Plesch's almost 70-page chapter on isobutene is a valiant effort to discuss comprehensively this difficult field to which he has made extensive contributions. In view of the experimental and theoretical complexities and the large amount of published but partly uninterpreted information available, the inexperienced reader must be careful to sort out fact from opinion in this complex chapter. The chapters on styrene and aryl olefins are outstanding contributions. The next six chapters cover oxygen, sulfur, and nitrogen containing monomers, subdivided into vinyl ethers, epoxides, other cyclic oxygen compounds, miscellaneous oxygen compounds, sulfur compounds, and nitrogen compounds. All of these contributions represent carefully written and well documented work, but this is particularly true of those that deal with epoxides and other cyclic oxygenated compounds.

The next chapter, on cationic copolymerization, is one of the highlights of the volume. It is undoubtedly the best treatise on cationic copolymerization that I have seen. A short chapter on cationic reactions of polymers and graft polymerization follows. The next to the last chapter is an excellent summary and discussion on cationic polymerizations induced by high energy radiation. The last contribution is a useful chapter on experimental techniques peculiar to this field of chemistry. I was disappointed by the omission of cationic polymerizations with catalysts of the Ziegler-Natta type and isomerization polymerizations (other than those mentioned by the editor in the introduction, particularly condensation polymerizations). There are most useful and comprehensive indices to compounds, subjects, and names.

In toto, this volume is a valuable and timely addition to the literature of polymer chemistry.

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Nematology

The Biology of Plant Parasitic Nematodes. H. R. Wallace. Arnold, London, 1963; St. Martin's Press, New York, 1964. viii + 280 pp. Illus. \$9.50.

The thin layer of soil beneath us has been one of the least known parts of man's environment. Although we depend on practical management of the soil for food, we have just begun to understand the complex interplay of organisms and physical factors which takes place in the upper foot or two of the earth's surface. Nematodes form an important part of this complex, and in the last two decades, an increased amount of attention has been focused on their role in crop production. This has brought to light our ignorance concerning most aspects of their biology as well as of the environmental features that influence their effects on plants.

H. R. Wallace, almost single-handedly, has begun to shed light on the physical factors of the soil in relation to nematodes. By using model systems in which particle size and suction are controlled, he has investigated the action of various physical factors of the soil on nematodes. Although this is admittedly a gross simplification of field conditions, it proves to be a useful tool in describing the world in which nematodes and other soil organisms operate.

Wallace's book reflects his own strong interest in ecology, and more particularly in the physical factors of the environment. He might well have titled it "The Ecology of Plant-Parasitic Nematodes, with Special Reference to Soil Environment." It is a thorough review of certain parts of plant nematology and a useful compilation of others. His treatment of morphology, taxonomy, reproduction, growth, and development constitutes 10 percent of the text. More than one-quarter of the text is devoted to the soil environment in relation to nematodes. Much of this section, which is a mature summation of the subject, represents Wallace's own work. Host-parasite relations, population dynamics, control, and behavior are treated in the remaining text. The extensive bibliography of recent literature fills about one-fifth of the book.

Nematology stands at the threshold of a new period. The recent successful axenic cultivation of parasites of ani-

mals and of free-living forms will permit the exploration of nematode physiology. Application of root-culture techniques to the study of host-parasite relations is already proving fruitful. Wallace presents a useful summary of our present position. As nematologists apply modern techniques to the pursuit of knowledge, we may expect a closer approximation to a "biology" of the plant-parasitic nematodes.

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Ornithology

Les Oiseaux du Nord de l'Afrique de la Mer Rouge aux Canaries. R. D. Etchécopar and François Hùe. Bou-bée, Paris, 1964. 606 pp. Illus. F. 120.

Africa north of the Sahara is predominantly European in its fauna, the important barrier between the Palaearctic and the Ethiopian biotas being the Sahara, not the Mediterranean. Zoologists have been aware of this, but a somewhat parochial attitude has nevertheless caused the northern parts of Africa to be slighted by specialists on both European and on African zoology, although as far as birds are concerned we have, it is true, detailed books on the avifauna of Egypt and less complete works on the birds of Tunisia, and even of Rio de Oro. The present work brings together in compact and useable form our knowledge of the birds of the entire Mediterranean portion of Africa, from the Canary Islands on the west, across Rio de Oro, Morocco, Algeria, Tunisia, and Libya, to and including Egypt at the eastern end of the region.

The book is a convenient summary of what is known of the appearance, distribution, and status of each of the birds as well as a manual for their identification. Preceding the treatment of each family there is a key for identification of the included species. Some of these keys are of the "museum" sort—that is, they involve such items as measurements of specimens in the hand, while others are more of the "field guide" type.

Each species is listed under its French name and Latin designation, and under each is added the name in English, Italian, German, and Span-

ish. This is followed by a discussion of identifying characters (both in the laboratory and in the field), behavior, nesting habits, distribution, and races. The account of each species is illustrated with a map on which its distribution and its migration are outlined. The plates are semidiagrammatic in some but not all cases; however all are obviously designed as adjuncts to identification, not merely as decorations for the book. There is an adequate index, and even a special index to the Arabic and Berber names of the birds.

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Boreal Faunas

Ordovician Paleontology of the Northern Hudson Bay Lowland. Memoir 90. Samuel J. Nelson. Geological Society of America, New York, 1963. x + 152 pp. Illus. Plates. \$6.75.

Ordovician rocks are exposed interruptedly along several of the rivers that drain into the southwestern Hudson Bay. This monograph is concerned with the exposures in northeastern Manitoba near Port Churchill and Port Nelson. The localities have been described much more fully than in the past, many excellent sections have been measured, and the fossils are recorded and described. The sequence of carbonate rocks is separated into several new groups and formations. The similarities in lithic and faunal sequences support the correlations with the Red River, Stony Mountain, and Stonewall formations of southern Manitoba, which are representative of medial and late Ordovician carbonate rocks that are widespread in the northern and western parts of the continent. Most of the memoir is devoted to systematic descriptions of fossils of several classes, particularly descriptions of corals and cephalopods; these are represented by many genera and species, some of them new. Brachiopods, which are abundant, and cephalopods of the genus *Diestoceras* are not included. The table of identified forms would be more useful, if relative frequencies were indicated. The many plates provide an excellent record of typical specimens.

The classification of the Manitoba sequence against the classic sections in

eastern areas has been a controversial subject. Stratigraphers seem to agree that the lower limestones can be traced on the surface and in the subsurface into Middle Ordovician Trentonian limestones; they attribute the faunal differences to undetermined ecological factors. Some paleontologists have been impressed by dissimilarities in organisms, particularly cephalopods, with those reported in Middle Ordovician in the East; they have classed the Red River as Upper Ordovician Cincinnati. Thus, solutions are strongly affected by the faith that the investigator places in differing sorts of information. Nelson does not enter the controversy significantly, but, with this memoir, he adds appreciably to knowledge on these so-called Arctic or boreal faunas that lived in the most extensive seas that have spread over the continent.

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Mathematics

Symmetry: An Introduction to Group Theory and Its Applications. R. McWeeny. Pergamon, London; Macmillan, New York, 1963. xiv + 248 pp. Illus. \$7.50.

In less than 250 pages, the author gives an introduction to group theory, a survey of the representation theory of finite groups, and the basic ideas of the applications of group theory to many problems in physics and chemistry. The book is aimed primarily at physics and chemistry graduates who do not have an extensive mathematical background. The author's plan to give a leisurely treatment of the mathematics that these students need and to do justice to the applications in such a short space rules out full discussions of most of the deeper topics, but his striking ability to illustrate each mathematical idea and physical application by well-chosen, fully worked out examples allows McWeeny to give more than a superficial presentation of his subject.

Close study of the examples is essential to counteract the occasional weakness of the accompanying discussion of the general mathematical concepts (for example, the impression that every linear mapping of a vector space has a multiplicative inverse is given in