between two parts of the book, a most inconvenient arrangement.

An authoritative list such as this challenges one to find reactions that were omitted. I was able to find some: the Finkelstein and Menschutkin reactions, the Robinson annelation procedure, and the Wohl-Aue phenazine synthesis. I also found some surprising entries: the "Cope-Mamlock-Wolffenstein hydroxylamine elimination" (this is the Cope amine oxide pyrolysis), the "Lieben" iodoform test, and the "Kriewitz-Prins" formaldehyde-olefin addition. I had never before encountered the names of Mamlock, Wolffenstein, Lieben, and Kriewitz associated with these well-known reactions.

This work suffered a good deal in translation. Some downright mistakes were made, such as cuprous *acetate* for CuCN (twice on p. 395) and an incorrect statement regarding the mechanism of the von Richter reaction (the German edition was correct). Syntax and words strange to English sometimes appear; my favorite is *minuity* in translation of *Kleinheit* (p. 28). Russian names are given only in their German transliteration; thus, the reaction known to American chemists as the Chugaev xanthate pyrolysis is listed only under "Tschugaeff."

The Wagner-Meerwein carbonium ion rearrangement (described only as a reaction of terpenes) and the Whitmore "anionomerism" of carbonium ions are unfortunately presented as separate topics, without cross-referencing.

Although the "dire need for the development of a systematic classification of terminology for organic reactions" is mentioned in the foreword and in the preface, no attention is given to systematic terminology in the book. I am personally disappointed that a method for systematically naming substitution reactions, which I suggested some years ago [*J. Chem. Soc. (London)*, 4717 (1954)], and which is now rather widely employed, was not presented.

The authors describe their book as having become "practically a textbook" of the most important organic reactions. They regard it as a good "summarizing review of organic chemistry" for use, say, by advanced students studying for comprehensive examinations. I do not share this view. Although the statements made, reaction by reaction, concerning mechanisms and synthetic applications are for the most part unobjectionable, they are in nearly every case too brief to convey a proper appreciation of either. Moreover, the attaching of men's names to reactions has only a haphazard relationship to their significance (the reactions' or the men's). Many obscure and trivial reactions are included, and many important ones that happen not to have "names" are omitted.

As a reference work for identifying reactions mentioned by name, this book is obviously useful. But if only one book of this sort can be purchased for a library, this volume should be compared with Gowan and Wheeler's *Name Index of Organic Reactions* (1960), which lists perhaps 40 percent more reactions and which has a format that is in some ways more convenient.

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Applied Botany

Biogeochemical Methods of Prospecting. Dmitrii Petrovich Malyuga. Translated from the Russian edition (Moscow, 1963). Consultants Bureau, New York, 1964. viii + 205 pp. Illus. $27.50.

The term "biogeochemical methods of prospecting" means the search for buried ore deposits by chemical analysis of living plants growing in the vicinity. In most parts of the world, ore deposits directly exposed at the surface have long since been found and developed. The present-day problem is to discover deposits that have been concealed beneath a blanket of soil or plant litter and thus cannot be found by casual inspection.

Malyuga's book is unquestionably the most complete synthesis to date of biogeochemical methods as they have been developed in the Soviet Union. The availability of this monograph in English gives the Western reader an insight into the very large volume of Russian activity that until now could be reviewed only in the Russian-language literature. Malyuga's list of references includes 375 items, of which 258 are Russian. The translation is excellent; the technical language is accurate, and the diagrams are if anything more legible than the original.

Unfortunately, the book suffers from certain fairly serious deficiencies. The text tends to be vague, so that the really significant and important observations, of which there are plenty, are difficult to winnow from the nondefinitive, wordy matrix. The maps and diagrams rarely have a scale of distance. The diagrams and tables are not always cross-referenced in a way that allows one to decipher easily the correlations and understand the interpretations that the author is trying to make. These, however, are technical problems, and Malyuga is not the only Russian author who can be accused of such sins.

The professional exploration geologist, whose eye is caught by the word "prospecting" in the title, will probably be disappointed in the author's uncritical treatment of his data. Only rarely are the plant data compared point-for-point with parallel data on trace elements in soils, and nowhere are they compared with the data of coextensive geophysical surveys. Nothing is said anywhere about the economics of the methods—how many samples or how large an area per man-day. And no legitimate case histories of biogeochemical discoveries, or even of operational field experience, are described. This failure to live up to the promise contained in the title will probably reduce the number of people who are willing to pay the rather shockingly high price that is asked for this volume.

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Mammalian Reproduction

The Biochemistry of Semen and of the Male Reproductive Tract. Thaddeus Mann. Methuen, London; Wiley, New York, 1964. xxiv + 493 pp. Illus. $16.50.

This book is an updating and an expansion of the material first published 10 years ago in *The Biochemistry of Semen*, a book that has been translated into French, Japanese, and Polish. This expanded second edition will receive the same acclaim accorded its predecessor by students of the reproductive processes and of biochemistry, practitioners of animal and of human medicine, and researchers and specialists in fields where a ready reference to the literature on male reproduction is needed. Although the book is primarily concerned with the

mammalian male, especially domestic animals and man, the author is interested in the total biochemical, biophysical, and biological phenomena of male reproduction and, being a keen student, he has brought together the widely scattered literature published in many languages and relating to many species. This labor has made available to those whose lingual competence is largely in English a wealth of literature heretofore unrecognized and unevaluated.

The book is not simply a compendium of the known chemical constituents found in spermatozoa, in the secretions of the testes and of the accessory glands of the male, and of the intermediary metabolism of these constituents, although these facts are given in detail; instead, the author has presented his material in the biological context in which such facts are important and relevant to a large number of present-day problems, such as male infertility, artificial insemination, and fertility control. Contributions from the author's own laboratory constitute an important part of the literature that he reviews. Researches elsewhere are sometimes viewed with less approbation, and the interpretations that he has made will not be universally approved.

It is a well-edited, fine book, carefully documented and indexed, and it will be highly useful. It is, as the author candidly stated in the preface to the first edition, not the last word in a rapidly developing field of scientific inquiry.

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1962 International Symposium

Pteridine Chemistry. Proceedings of the Third International Symposium (Stuttgart, Germany), September 1962. Wolfgang Pfleiderer and Edward C. Taylor, Eds. Pergamon, London; Macmillan, New York, 1964. xx + 535 pp. Illus. $15.

The stated purpose of the Third International Symposium on Pteridine Chemistry, held in Stuttgart in September 1962, was "to bring together 'pteridinologists' from many different disciplines so that cross-fertilization of ideas and mutual stimulation would provide new insight into present problems and point out new paths for exploration." It called together 52 participants from laboratories of biochemistry, medicinal chemistry, organic chemistry, botany, and zoology, attached to universities, technische hochschulen, medical schools, and drug-manufacturing concerns, as well as one representative from the National Institute of Mental Health. The focus was on chemistry and biochemistry, but it was by no means a narrow one. There were reports on the synthesis of pteridines and their derivatives, on their transformations, rearrangements, and other chemical properties, on their occurrence in nature, on their isolation, separation, structure, properties, assay, and even elemental microanalysis, on their biosynthesis, on their functions in various enzyme systems and on the interrelationships of the various metabolic processes in which they take part, and on the synthesis and properties of related compounds. Thus, in this volume based on the symposium there are chapters on the proton-resonance spectra of pteridines, on tetrahydrofolic acid as the coenzyme of one-carbon metabolism, and on the synthesis of folic acid antagonists, to mention the subjects of but three of the 36 chapters.

The record of the symposium begins with a chapter by C. Schöpf, "Die Anfänge der Pterin-Chemie," tracing the development of the field from the first observations made in the period around 1890 through the establishment of the structures of the most common pteridine pigments some 50 years later. The 35 technical chapters follow, 17 of them in German and 18 in English. Each chapter is preceded by a short abstract in English. Each has its own bibliography, and nearly every chapter is followed by a transcript of the discussion that followed the oral presentation; both languages are used in the discussions. There are but two or three addenda, made for the purpose of clarification or correction on the basis of data not available at the time of the symposium. No attempt has been made to extend the literature coverage beyond September 1962; the dozen or so references that have later dates are probably to articles that were in press at the time of the symposium.

Perhaps the most important function of a volume like this one should be that of informing interested scientists not in attendance at the symposium concerned, giving them also the benefit of the summaries and correlations, and thus improving their position for further studies. Thus, the success of the volume would seem to hinge on the accuracy of its reporting and the promptness of its publication. Evidently this book is a faithful record of the papers presented and the formal discussions which constituted the symposium. The 2-year delay in publication is, of course, a disadvantage. But despite the delay in publication, the book will be needed by chemists engaged in the study of pteridines and valuable to many others concerned with substances metabolically related to pteridines.

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New Books

Mathematics, Physical Sciences, and Engineering

An Introductory Course of Mathematics and Theoretical Mechanics. vol. 4, *Theoretical Mechanics*. C. Plumpton and W. A. Tomkys. Pergamon, London; Macmillan, New York, 1964. 464 pp. Illus. $3.50.

Local Analytic Geometry. Shreeram Shankar Abhyankar. Academic Press, New York, 1964. 502 pp. Illus. $18.

Mathematical Theory of Optics. R. K. Luneburg. With a foreword by Emile Wolf and supplementary notes by M. Herzberger. Univ. of California Press, Berkeley, 1964. 478 pp. Illus. $12.50.

Microwave Circuits. Jerome L. Altman. Van Nostrand, Princeton, N.J., 1964. 484 pp. Illus. $15.

Modern Earth Science. William L. Ramsey and Raymond A. Burckley. Holt, Reinhart, and Winston, New York, ed. 2, 1965. 672 pp. Illus.

Numerical Methods of Reactor Analysis. Melville Clark, Jr., and Kent F. Hansen. Academic Press, New York, 1964. 352 pp. Illus. $10.50.

Ordinary Differential Equations. Philip Hartman. Wiley, New York, 1964. 628 pp. Illus. $20.

Particulate Clouds: Dusts, Smokes, and Mists. Their physics and physical chemistry and industrial and environmental aspects. H. L. Green and W. R. Lane. Van Nostrand, Princeton, N.J., ed. 2, 1964. 493 pp. Illus. Plates. $13.50.

Theory of Laminar Flows. F. K. Moore, Ed. Princeton Univ. Press, Princeton, N.J., 1964. 883 pp. Illus. $25. The papers are "Laminar flow theory" by P. A. Lagerstrom; "Three-dimensional laminar boundary layers" by A. Mager; "Theory of time-dependent laminar flows" by Nicholas Rott; "Hypersonic boundary layer theory" by F. K. Moore; "Laminar flows with body forces" by Simon Ostrach; and "Stability of laminar flows" by S. F. Shen. There is an introduction by the editor.