also but a minor component of the subtropical Tampa and Mobile Bay sediments, a function probably of river discharge and reduced salinity. The use of calcite as a climatic indicator is clearly of great subtlety.

D. C. Krause fills in the semidetailed study of the Southern California continental borderland begun by Shepard and Emery a quarter century ago. Most interesting are his excellent underwater photographs, showing tracked surfaces, at 1935 and 3550 meters, which palichnologists would probably classify as most likely shelf features.

No one would expect all papers in such a volume to be of equal quality or verbal parsimony, and they are not. It is an organizational defect that they do not have abstracts or summaries to help in sorting them out. Of the typographical errors noted, only one is important—the photograph, Fig. 24.4B, was taken in 1918, not 1910, and looks north, not south.

Leaving quibbles aside, Fran Shepard can well be proud of his book, his boys, and himself. Many who were not his former students join in wishing him well in retirement.

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Inorganic Chemistry

Non-Stoichiometric Compounds. L. Mandelcorn, Ed. Academic Press, New York, 1964. xiv + 674 pp. Illus. $22.50.

At the end of the 18th century, the general discussion between Berthollet and Proust led to the conception that chemical compounds have a constant composition, and on this basis the general development of chemistry has proceeded. But at the end of the 19th century, when investigations concerning the mutual behavior of metals were carried out, many examples of intermetallic phases with broad "homogeneity ranges" were stated. In the meantime we have discovered "nonstoichiometric" compounds—solid substances of very different character. How manifold the fields concerned are is demonstrated in this book, edited by L. Mandelcorn. The volume contains the following chapters: (i) "X-ray structural analysis" (J. M. Robertson, 46 pages); (ii) "Statistical thermodynamics and reaction rate theory" (D. Henderson and H. Eyring, 46 pages); (iii) "Inorganic non-stoichiometric compounds" (A. D. Wadsley, 103 pages); (iv) "Occluded gases in transition metals" (O. M. Katz and E. A. Gulbransen, 51 pages); (v) "Physical properties of nonstoichiometric inorganic compounds" (C. Subbarao, 38 pages); (vi) "Inorganic inclusion complexes" (R. M. Barrer, 121 pages); (vii) "Clathrates" (H. M. Powell, 52 pages); (viii) "Organic adducts" (L. C. Fetterly, 73 pages); (ix) "Carbohydrates" (F. R. Senti and S. R. Erlander, 35 pages); and (x) "Physics and chemistry of inclusion complexes" (L. A. K. Staveley, 29 pages).

In general, the different chapters are well written and provide a good introduction to the different fields. Predominant emphasis is given to structural questions; indeed, the existence of many nonstoichiometric compounds is understandable only on the basis of structural pecularities. On the other hand, more detailed structural investigations have demonstrated that in some cases the assumed nonstoichiometry does not exist, but that a great number of stoichiometric compounds of very similar, although complicated, structures are present. The discussion of the properties of the substances is a bit brief. And some other chapters should have been enlarged. Why is the otherwise well-written chapter 3 restricted to oxides and other chalcogenides? A treatment of halogenides, phosphides, and the like, and especially of nonstoichiometric intermetallic compounds, would be most interesting. The same is true with respect to chapter 5, and in chapter 4 one is disappointed to read only of hydrides. In a second edition, chapters 3, 4, and 5 should be enlarged.

In general this book is very useful and can be recommended.

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Optical Methods of Analysis

Treatise on Analytical Chemistry. Part 1, Theory and Practice. vol. 5, *Optical Methods of Analysis*. I. M. Kolthoff and Philip J. Elving, Eds. Interscience (Wiley), New York, 1964. xx + 640 pp. Illus. $16.

This fifth volume in part 1 of the *Treatise on Analytical Chemistry* represents the first of two volumes that will be devoted to optical methods of analysis. Edward J. Meehan assisted the editors as section adviser. Individual chapters include "Optical methods: Emission and absorption of radiant energy," "Fundamentals of spectrophotometry," and "Spectroscopic Apparatus and Measurements," all by Meehan; "Principles of light scattering" by Fred W. Billmeyer, Jr.; "Specification and designation of color" by D. B. Judd and I. Nimeroff; "Ultraviolet and visible spectrophotometry" by Alfred A. Schilt and Bruno Jaselskis; "Fluorometry" by Anne L. Conrad; "X-ray methods: Absorption diffraction and emission" by H. A. Liebhafsky, H. G. Pfeiffer, and E. H. Winslow; "X-ray microanalysis by means of electron probes" by David B. Wittry; "Microwave spectrophotometry" by J. H. Goldstein, and "Nephelometry and turbidimetry" by Frank P. Hochgesang. Generally, the chapters are well written and contain a minimum number of typographical errors. This volume follows the format of earlier volumes of the *Treatise.*

Although it is a difficult task for an editor to integrate a collection of chapters written by different individuals into a coherent presentation, I feel that the volume could have been better organized. For example, optical components of instrumentation (prisms, gratings, and so forth) are discussed in chapter 55, but light sources and detectors are dealt with in the second part of chapter 58. Interposition of chapters on light scattering (chapter 56) and specification of color (chapter 57) between fundamentals of spectrophotometry (chapter 54) and ultraviolet visible spectrophotometry (chapter 58) hardly seems desirable. Also, there appears to be undue repetition and fragmentation of topics between chapters. For example, Tables 53.I and 58.I are essentially identical. Atomic transitions, the Beer-Lambert law and derivations from it, precision spectrophotometry, and spectrophotometric analysis of mixtures are all treated, to varying degrees, in more than one place.

The volume is not without serious technical errors and omissions. In the consideration of environmental effects on ultraviolet absorption spectra (p. 2955 *et seq.*), no mention is made of the *p*H-dependency of spectra for molecules containing acidic or basic groups. The statement is made that ". . . a double monochromator cannot be used with a single vacuum phototube" (p. 3006), even though several